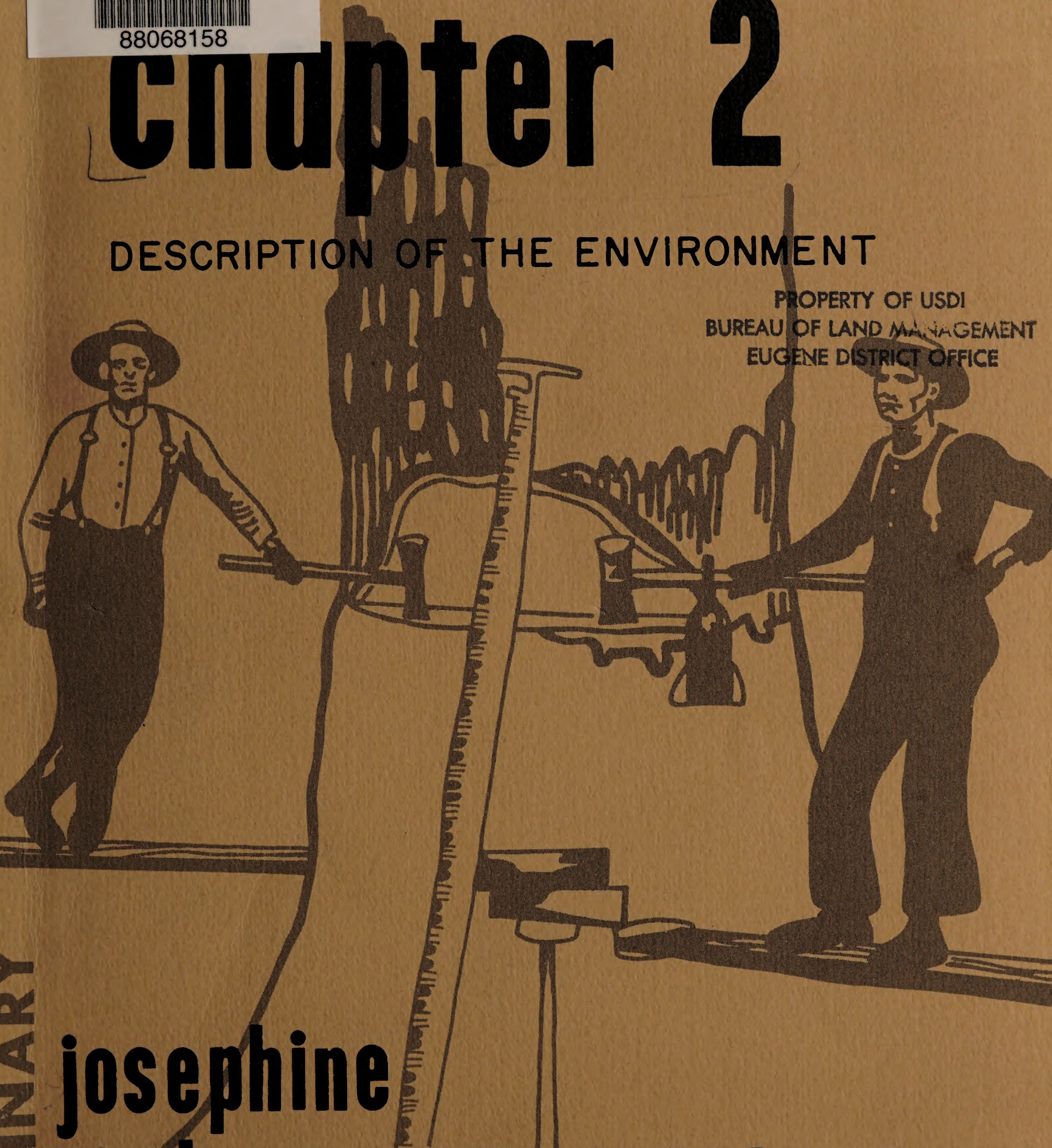
chapter 2

DESCRIPTION OF THE ENVIRONMENT



PRELIMINARY

josephine timber management environmental statement

chapter 2

DESCRIPTION OF THE ENVIRONMENT

PRELIMINARY DRAFT

JOSEPHINE TIMBER MANAGEMENT
ENVIRONMENTAL STATEMENT

JULY 1977

PREPARED BY ● ● ●

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DESCRIPTION OF THE ENVIRONMENT

In preparation of this chapter the primary data source is documents of the Bureau planning system for the Josephine Planning Area. Unit Resource Analysis documents for Grants Pass, Galice, and Glendale Planning Units and the Planning Area Analysis and Management Framework Plan for Josephine Planning Area are available for review at Medford District Office, 310 West 6th Avenue, Medford, Oregon, 97501.

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EXISTING ENVIRONMENT

The following sections address the environment as it exists today within Josephine Sustained Yield Unit (JSYU, SYU). Since intensive timber management has been practiced within the SYU for several decades, the environment described is seldom natural or pristine but exhibits the actions of man.

As with any environmental statement, this section is critical as a basis on which impacts of the proposed action may be assessed. In preparation of Chapter 2 the team was cognizant of the proposed action and addressed those elements of the environment which might be affected. Peripheral environmental data are included only to the extent necessary to provide the basic picture.

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Physical Environment

Physical environment as used here refers to the non-living or inorganic elements of the environment. The following subsections address typical categories of physical environment using the standard measurement devices of each.

Climate

The climate of the Josephine Sustained Yield Unit (SYU) is transitional between the Mediterranean climate to the south and the marine, mesothermal climate to the north. The area experiences mild, wet winters and short, dry summers. The climate is strongly influenced by weather systems over the Pacific Ocean. Upland areas in the Siskiyou mountains have higher precipitation totals and colder temperatures than the interior valleys (Applegate-Rogue River Valleys and Illinois River Valley).

Temperatures have a variation strongly influenced by the altitude of the measuring station. Sexton Summit (3800 ft.) averages 48 degrees annually; Grants Pass (425 ft.) averages 53 degrees annually.

Precipitation is winter concentrated; 80 per cent of all precipitation occurs between mid-October and mid-April. Winter storms from the north Pacific Ocean provide most of the rain and snow.

During periods of prolonged high pressure (especially in winter) temperature inversions and stagnant air occur. When occuring in winter, the stagnant air remains at a constant temperature in the middle 30's. Radiation fog often occurs with the inversions. Air pollution occurs during such inversions due to a build up of noxious gasses and particulat matter.

Climate Classification

The climate of the Josephine unit lies in a zone of transition between the Mediterranean climate to the south and the marine-mesothermal climate to the north. Figure 2.1.1-1 illustrates a typical Mediterranean climate (Sacramento, California), a station within the boundaries of the SYU (Grants Pass, Oregon), and a marine-mesothermal climate (Portland, Oregon) (Trewartha, 1954). The transitional nature of the climate zone surrounding the SYU is important in understanding the patterns of vegetation and soils in the region.

Temperature and Precipitation

Altitude, aspect (the direction a slope faces), and wind patterns affect temperatures and precipitation in the SYU. Table 2.1.1-1 illustr temperature and precipitation data for representative stations in the SYU. Freezing temperatures may be expected from October 16 through May 17 at Grants Pass (Ruttle, 1973). Lowest temperatures rarely fall below 16 degrees in the SYU. Maximum temperatures occur in July, often

exceeding 90 degrees (sometimes reaching 100 degrees). Figure 2.1.1-2 shows the locations of weather stations in the SYU.

Precipitation is winter concentrated. Table 2.1.1-1 also illustrates the total annual precipitation for recording stations in the SYU. Note that the June through August amounts are a small fraction of the total annual precipitation. Grants Pass receives 5.8 inches of precipitation in January, while receiving only 0.25 inches in July (Ruttle, 1973). Snowfall is concentrated above 2500 feet. Snow is retained as a cumulative snowpack above 3000 feet from December to May. The lower elevations and valleys receive only minor amounts of snow (less than one foot total per winter), all of which melts quickly. Figure 2.1.1-3 illustrates mean annual precipitation over the SYU and vicinity.

Winds

The direction and intensity of winds depends on the pressure gradient between air masses, altitude, and topographic features (wind gaps, etc.). Winds in the Josephine SYU are initiated by weather systems over the Pacific Ocean. During summer an extensive high pressure system dominates the northern Pacific Ocean. The clockwise rotation of warm dry air about this system overlaps into the Pacific Northwest. Northerly winds of very light intensity (0-5 mph) dominate the SYU in July and August. Moist unstable air drifts into the SYU during summer, causing brief thunder showers. Winds during such storms are variable in direction and intensity. Westerly winds of 10-30 mph are common in winter.

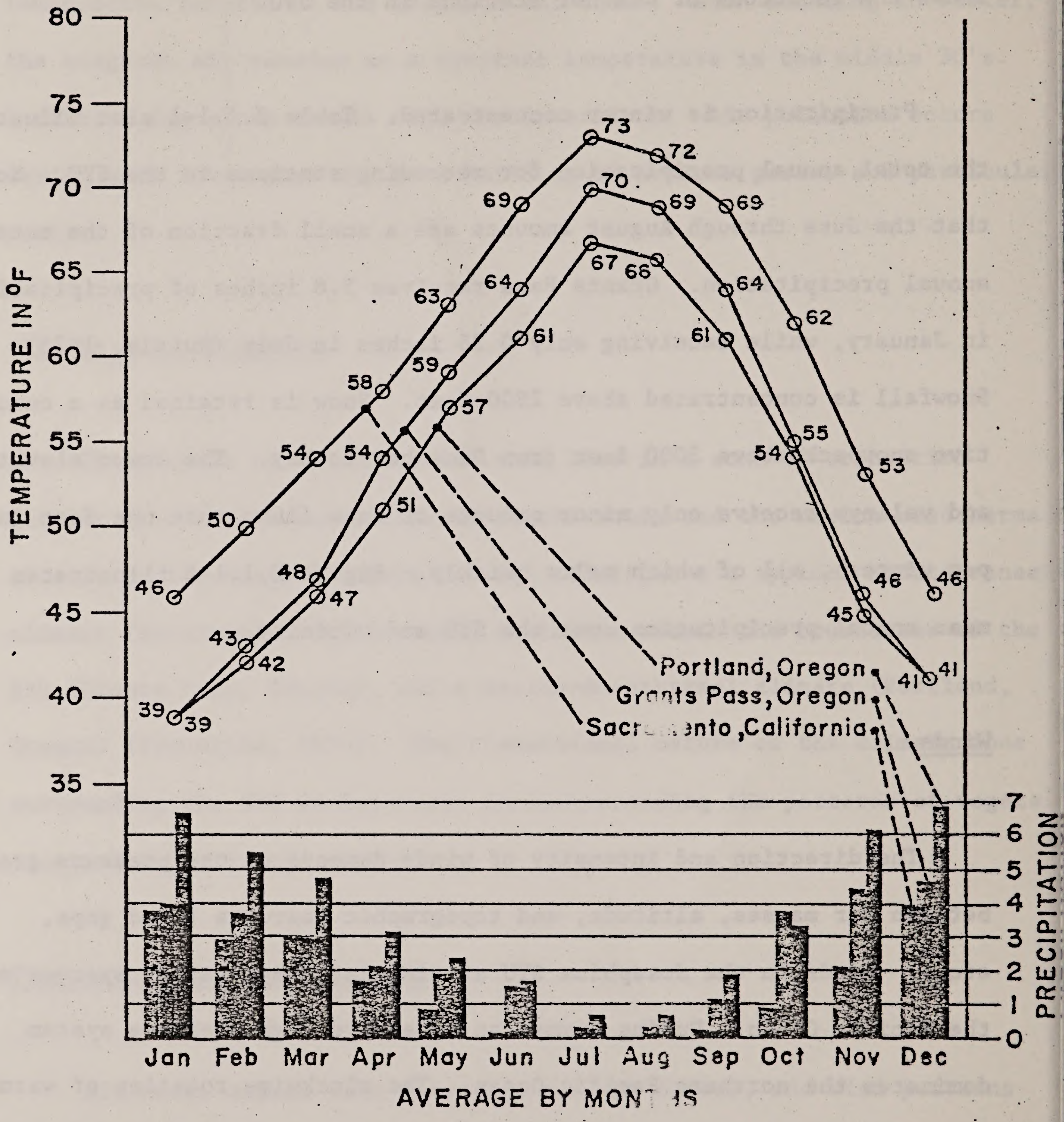


Figure 2.1.1-1 RELATIONSHIP BETWEEN 2 CLIMATE STATIONS (1 MARINE•MESOTHERMAL & 1 MEDITERRANEAN) WITH A REPRESENTATIVE STATION IN THE SYU

SOURCE: Trewartha, 1954 & Johnsgard, 1963

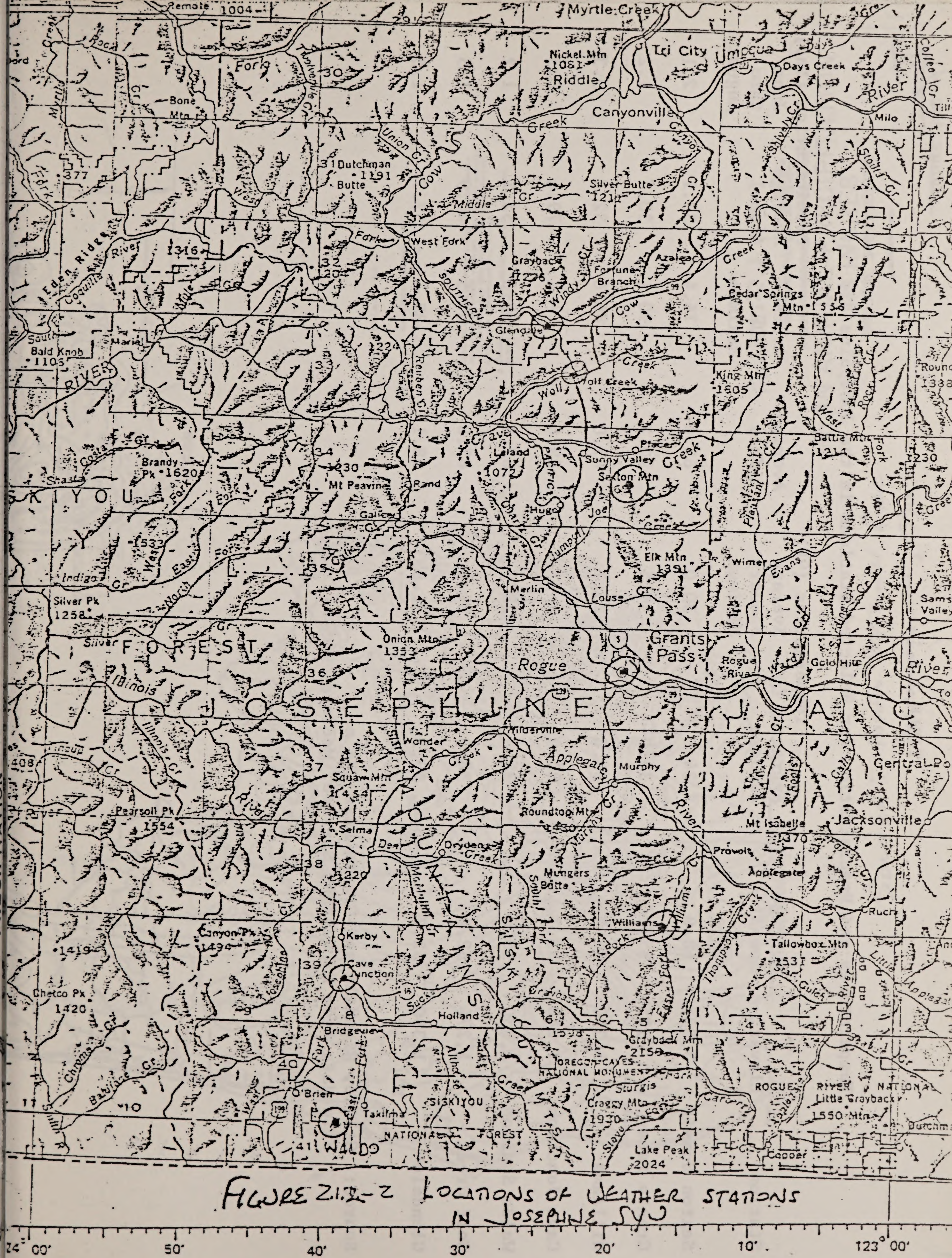


FIGURE 21.2-2 LOCATIONS OF WEATHER STATIONS IN JOSEPHINE SYU

No adjacent map

TABLE 2.1.1-1

Temperatures and Precipitation for Selected Stations in the Josephine SYU

Station	Elevation	Temperatures (°F) Average Annual	Average January	Average January Minimum	Average July	Average July Maximum	Precipitation (in.) Average Annual	June thru August
Sexton Summit	3,836	48.0	34.1	30.0	63.6	76.4	33.1	2.1
Grants Pass	925	53.8	39.0	31.5	70.2	90.1	30.2	1.2
Williams	1,370	52.0	38.6	29.7	67.0	86.6	32.3	0.3
Cave Junction	1,280	53.3	38.9	--	69.6	--	79.4	0.3
Waldo Station	1,650	50.6	36.6	28.3	67.3	88.0	52.1	1.2
Wolf Creek	1,274	52.9	38.6	31.4	67.8	87.5	40.9	1.5
Glendale	1,390	52.7	39.5	31.8	68.1	88.1	37.7	1.5

Source: Galice, Glendale and Grants Pass URA's
File data from US Weather Service, Medford

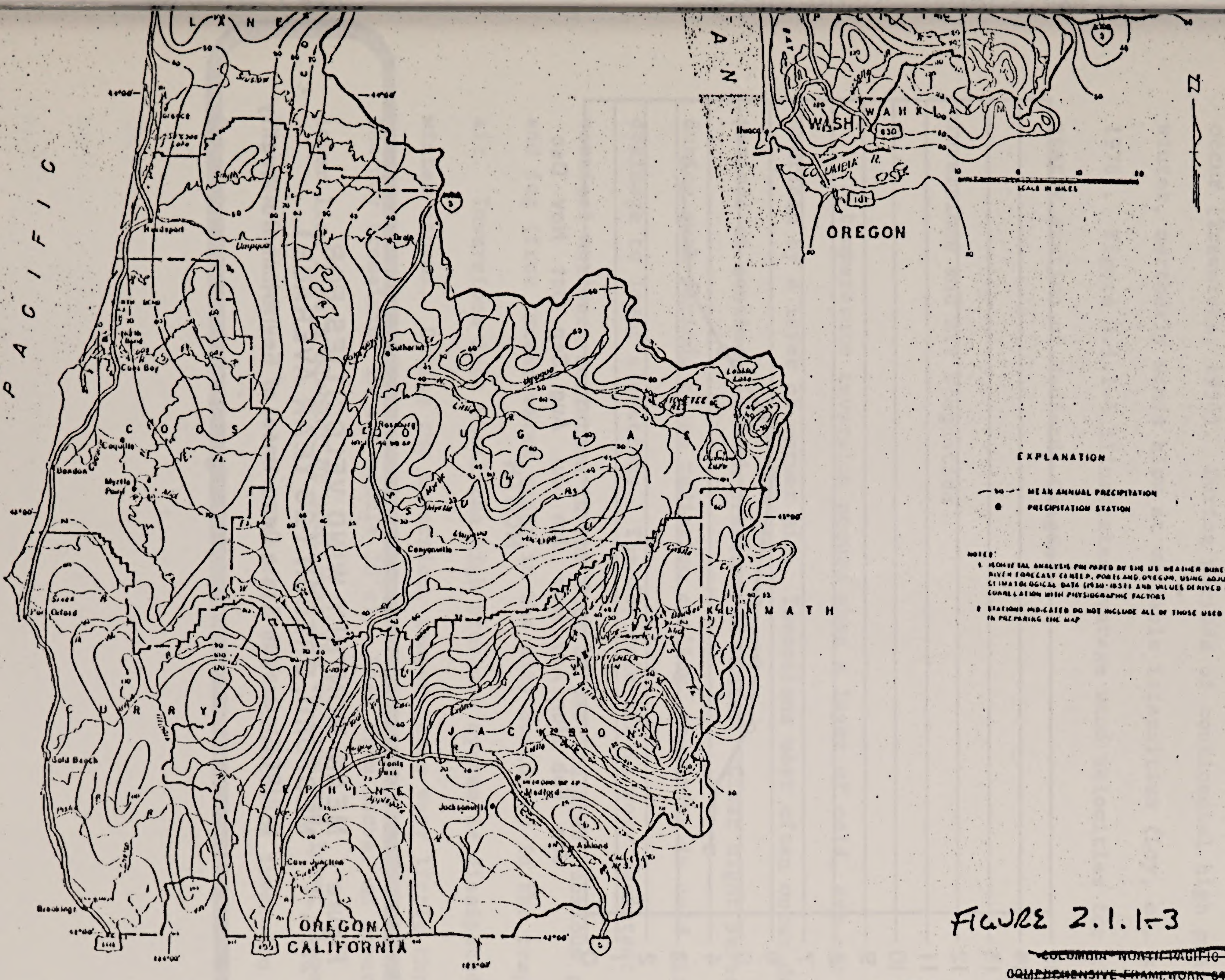


FIGURE 2.1.1-3

~~COLUMBIA-NORTH PACIFIC~~
~~COMPREHENSIVE FRAMEWORK STUDY~~

MEAN ANNUAL PRECIPITATION
IN INCHES

~~COASTAL SUBREGION 10~~

~~FIGURE 665~~

Source: Pacific Northwest River Basins Commission, 1970

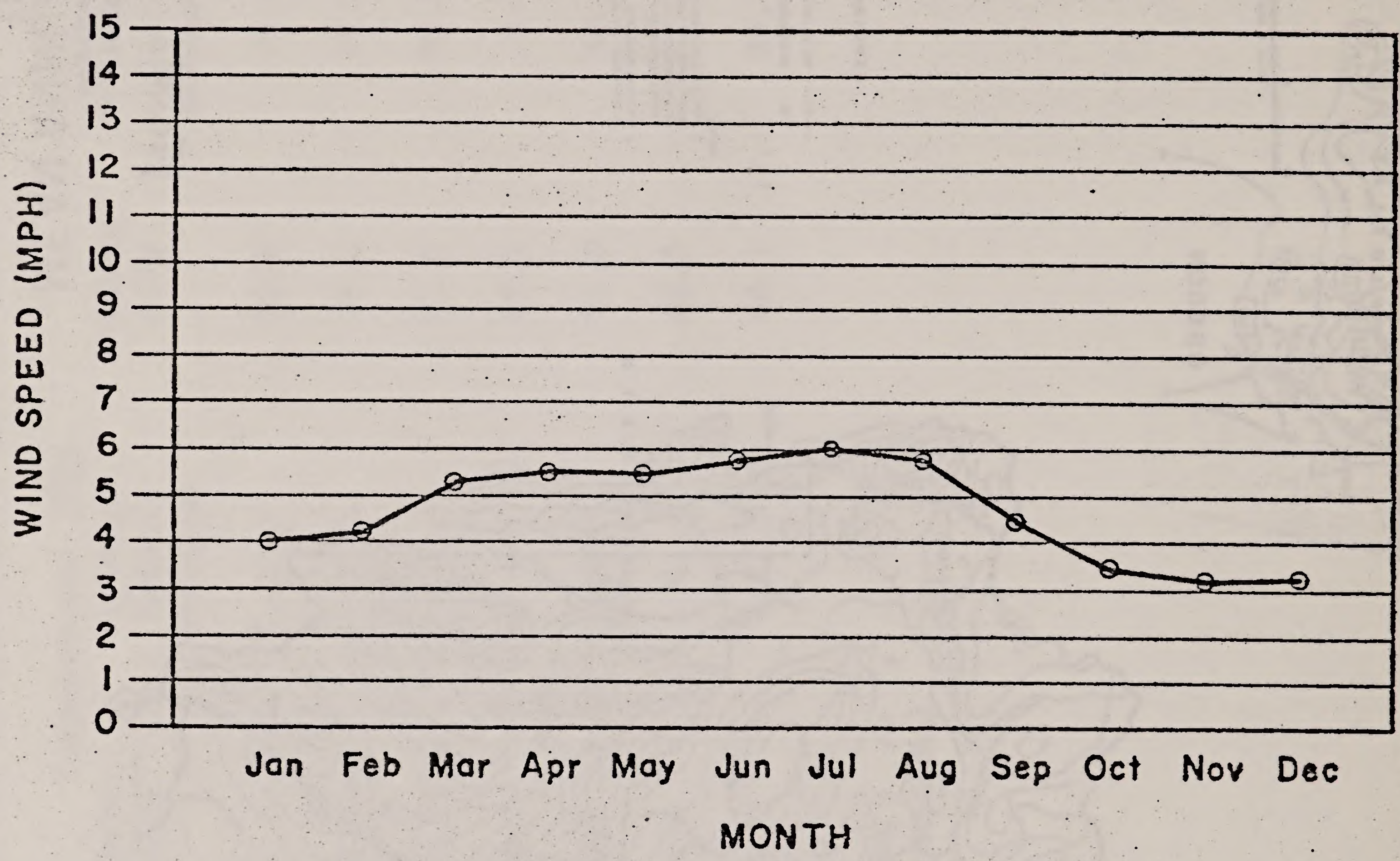
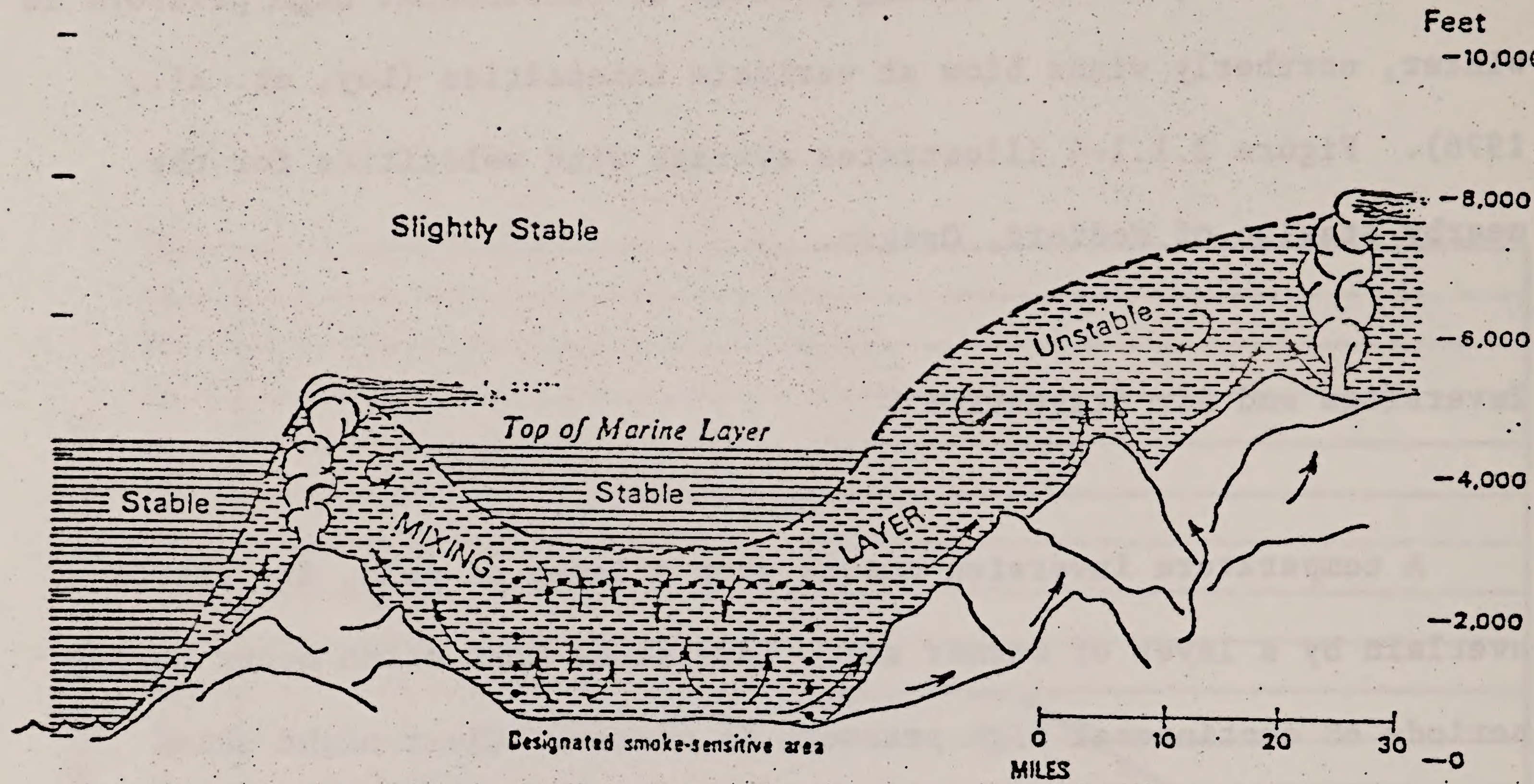


Figure 2.1.1-4 - MEAN MONTHLY WIND VELOCITIES FOR MEDFORD, OREGON (26 YEAR AVERAGE)
SOURCE: Oregon State Department of Environmental Quality

During the approach of cyclonic storms (weather fronts), winds blow out of the south to southwest. After the passage of fronts, westerly winds occur (Trewartha, 1954). During periods of continental high pressure in winter, northerly winds blow at variable intensities (Loy, et. al., 1976). Figure 2.1.1-4 illustrates average wind velocities for the nearby station of Medford, Oregon.

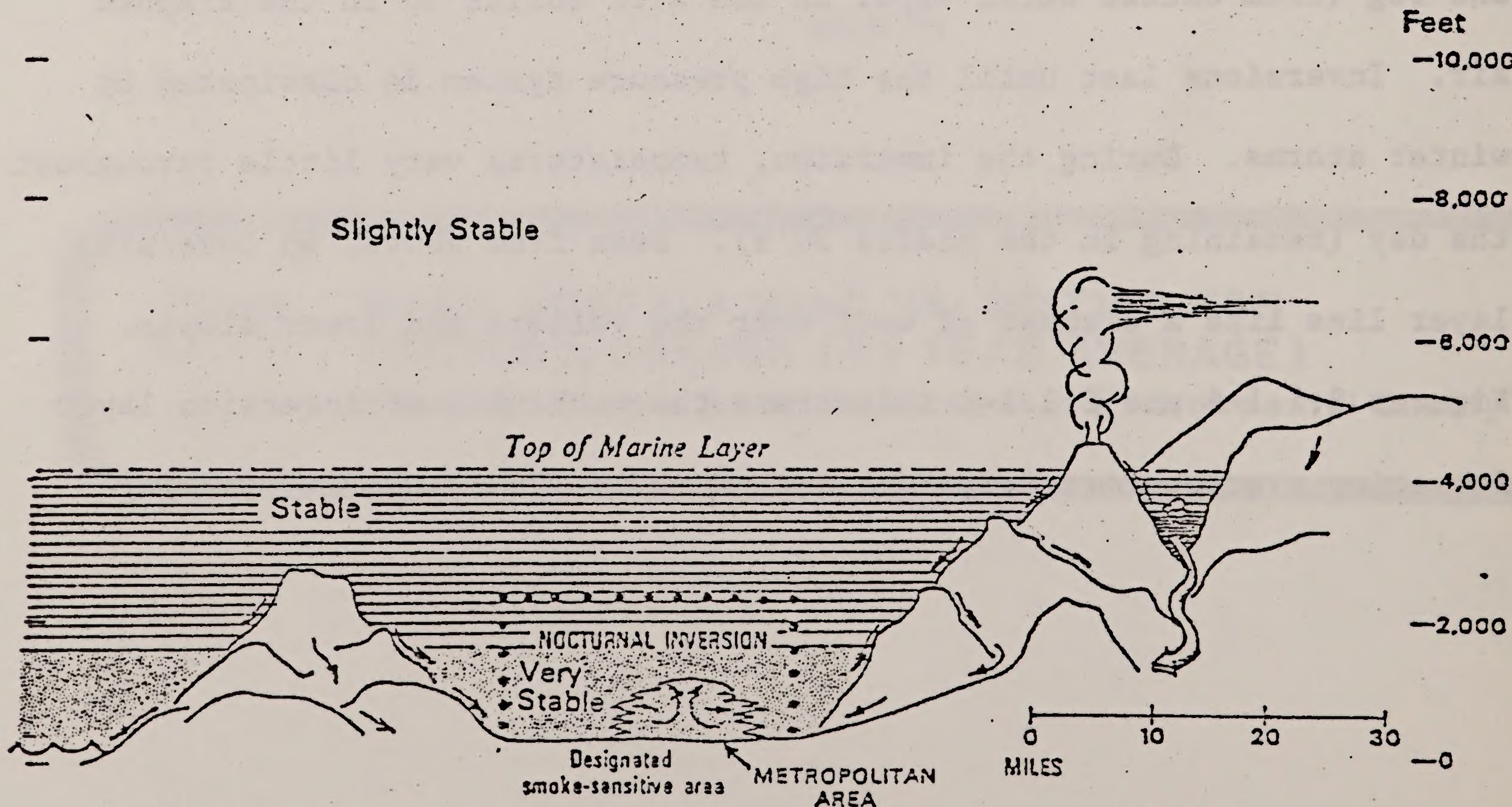
Inversions and Air Stagnation

A temperature inversion occurs when a layer of cold, dry air is overlain by a layer of warmer air. Inversions most often occur during periods of continental high pressure in winter. Clear night skies during such periods cause radiation cooling, resulting in cold air drainage to lower elevations. The dry cold air is very resistant to any vertical motion. Pollution in the form of particulates, noxious gases, and fog (from excess water vapor in the air) builds up in the trapped air. Inversions last until the high pressure system is dissipated by winter storms. During the inversion, temperatures vary little throughout the day (remaining in the middle 30's). Seen from above, an inversion layer lies like a blanket of wool over the valleys and lower slopes. Figures 2.1.1-5 and 2.1.1-6 illustrate the mechanics of inversion layer formation over western Oregon.



Z.1.1.-5

Figure 1.--Common ~~mesoscale and~~ local afternoon dispersion conditions west of the Cascades during the warm season. The mixing layer is shallower in cooler seasons.



Z.1.1.-6

Figure 2.--Common nighttime or early morning condition during the warm season west of the Cascades. Downslope breezes develop on still, clear nights. Similar stratified conditions without downslope breezes may persist throughout the day during the colder seasons and during rainy weather.

 Source: Cramer, et al., 1974

Air Quality

The following discussion is paraphrased from "Oregon Air Quality Annual Report 1975" and "Air Quality Profile and Evaluation for Southwest Oregon Intrastate Air Quality Control Region" released in 1976 by the Oregon Department of Environmental Quality.

Oregon has complied with regulations set by the Environmental Protection Agency (EPA) for ambient air quality. The state has been divided by the Oregon Department of Environmental Quality (DEQ) into Air Quality Control Regions (AQCR). The Josephine SYU lies in the Southwest Oregon AQCR. The only sampling station in the SYU is at Grants Pass, Oregon.

Current air quality meets the federal secondary standards. Only occasional dust has lowered air quality below standards in 1975. All air pollution sources have been inventoried. Monitoring of air quality occurs continuously.

Authority

The Clean Air Act Amendments of 1970 require each state to submit to the EPA a State Implementation Plan (SIP) detailing a proposal to implement ambient air quality standards. Oregon's SIP specifies control measures to be applied to sources of air pollution. The EPA has set

primary and secondary standards for several pollutants. Primary standards relate to those levels effecting health and well being. Secondary standards are based on those levels effecting property, materials, and personal comfort. The standards indicate levels of pollution for several specific contaminants which may not be exceeded in a geographical area. Oregon has adopted the secondary standards as its absolute level of contaminants. Table 2.1.1-2 gives Federal and Oregon Ambient Air Quality Standards. The Oregon DEQ has authority to monitor and enforce air quality standards.

Oregon has been divided into five Federal AQCR's on the basis of pollution concentrations, geography, and economics. The Josephine SYU lies in the Southwest Oregon AQCR. The EPA has required the states to identify those areas which, due to current ambient air quality and/or projected growth rate, may exceed national air quality standards within 10 years after June, 1975. These Air Quality Maintenance Areas (AQMA) are undergoing thorough analysis. A control strategy for maintaining standards will be developed for each AQMA after analysis. Computer simulation models have been developed for augmenting control strategies. From model estimates of downwind pollutant concentrations, impact evaluations and control measures may be determined. An Emissions Inventory lists (EI) all sources in Oregon for which air pollution records are maintained. These records contain estimates of total emissions for the following pollutants: total particulates, fine particulates, sulfur oxides, nitrogen oxides, carbon monoxides, organic compounds, and inorganic compounds. Figures 2.1.1-7 through 2.1.1-10 illustrate the

Table 2.1.1-2

State of Oregon
Department of Environmental Quality
Air Quality Control Division
Ambient Air Standards

Contaminant	Federal Standards: Primary	Federal Standards: Secondary	State of Oregon Standards
Carbon-Monoxide	(1) 10 mg/M^3* max. 8-hr average [a]	Same as primary	(1) 10 mg/M^3 max. 8-hr average[a]
	(2) 40 mg/M^3 max. 1-hr average [a]	Same as primary	(2) 40 mg/M^3 max. 1-hr average[a]
Sulfur-Dioxide	(1) 80 ug/M^3** annual arithmetic mean		(1) 60 ug/M^3 annual arithmetic mean[b]
	(2) 365 ug/M^3 max. 24-hr concentration[a]	1300 ug/M^3 max. 3-hr average	(2) 260 ug/M^3 max. 24-hr average[a,b]
			(3) 1300 ug/M^3 max. 3-hr average[a]
Photochemical Oxidant	160 ug/M^3 max. 1-hr average [a]	Same as primary	160 ug/M^3 max. 1-hr average[a]
Notrogen-Dioxide	100 ug/M^3 annual arithmetic mean	Same as primary	100 ug/M^3 annual arithmetic mean
Reactive Hydrocarbons	160 ug/M^3 max. 3-hr average 0600-0900[a]	Same as primary	160 ug/M^3 max. 3-hr avg. 0600-0900[a]
Suspended Particulate	(1) 75 ug/M^3 annual geometric mean	(1) 60 ug/M^3 annual geometric mean as a guide	(1) 60 ug/M^3 annual geometric mean
	(2) 260 ug/M^3 max. 24-hr concentration[a]	(2) 150 ug/M^3 max. 24-hr concentration[a]	(2) 100 ug/M^3 24-hr concentration more than 15% of time[c]
			(3) 150 ug/M^3 maximum 24-hr concentration[a]
Particle Fallout	None	None	(1) 10 gms/M^2/month in an industrial area
			(2) 5.0 gms/M^2/month in an industrial area if presence of soot or woodwaste and volatile fraction exceeds 70%
			(3) 5/9 gms/M^2/month in a residential or commercial area or 3.5 gms/M^2/month if soot, woodwaste are present or volatile portion exceeds 70%
Calcium Oxide As Suspended Partilate	None	None	(1) shall not exceed 20 ug/M^3 in residential or commercial areas at any time
Calcium Oxide as Particle Fallout	None	None	(2) shall not exceed 0.35 gms/M month at any station
Lead	None	None	Shall not exceed 3.0 ug/M^3 monthly average at any station

*Milligram per cubic meter
** Microgram per cubic meter
a = "not to be exceeded more than once per year."
b = "Federal Regulations on this standard revoked September 14, 1973."
c = "For samples collected during a calendar month."

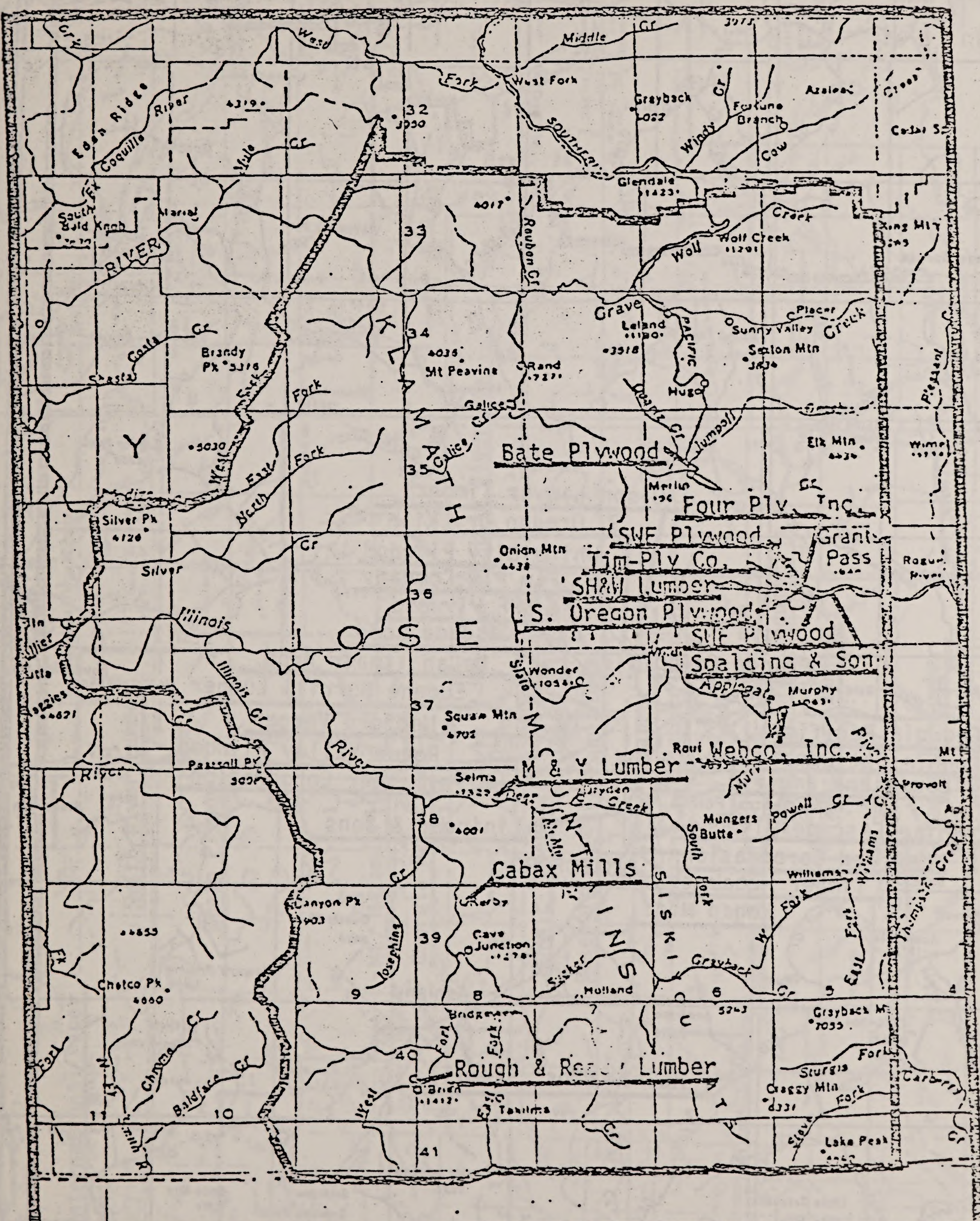
FIGURE 2.1.1.-7

Southwest Oregon Intrastate

Air Quality Control Region

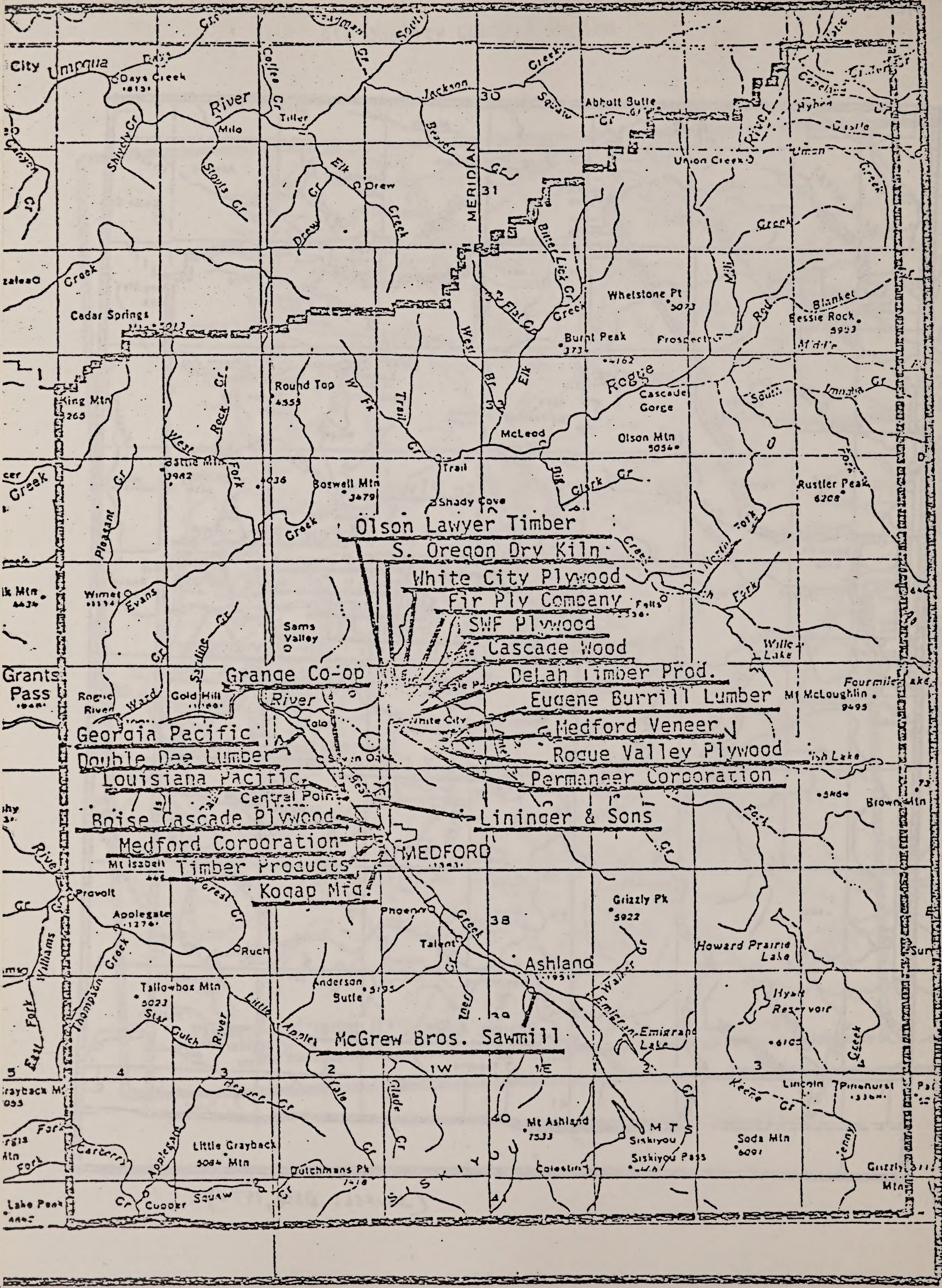
(Source: DEQ, 1976)

FIGURE 2.1.1.-8 Josephine County - Major Sources



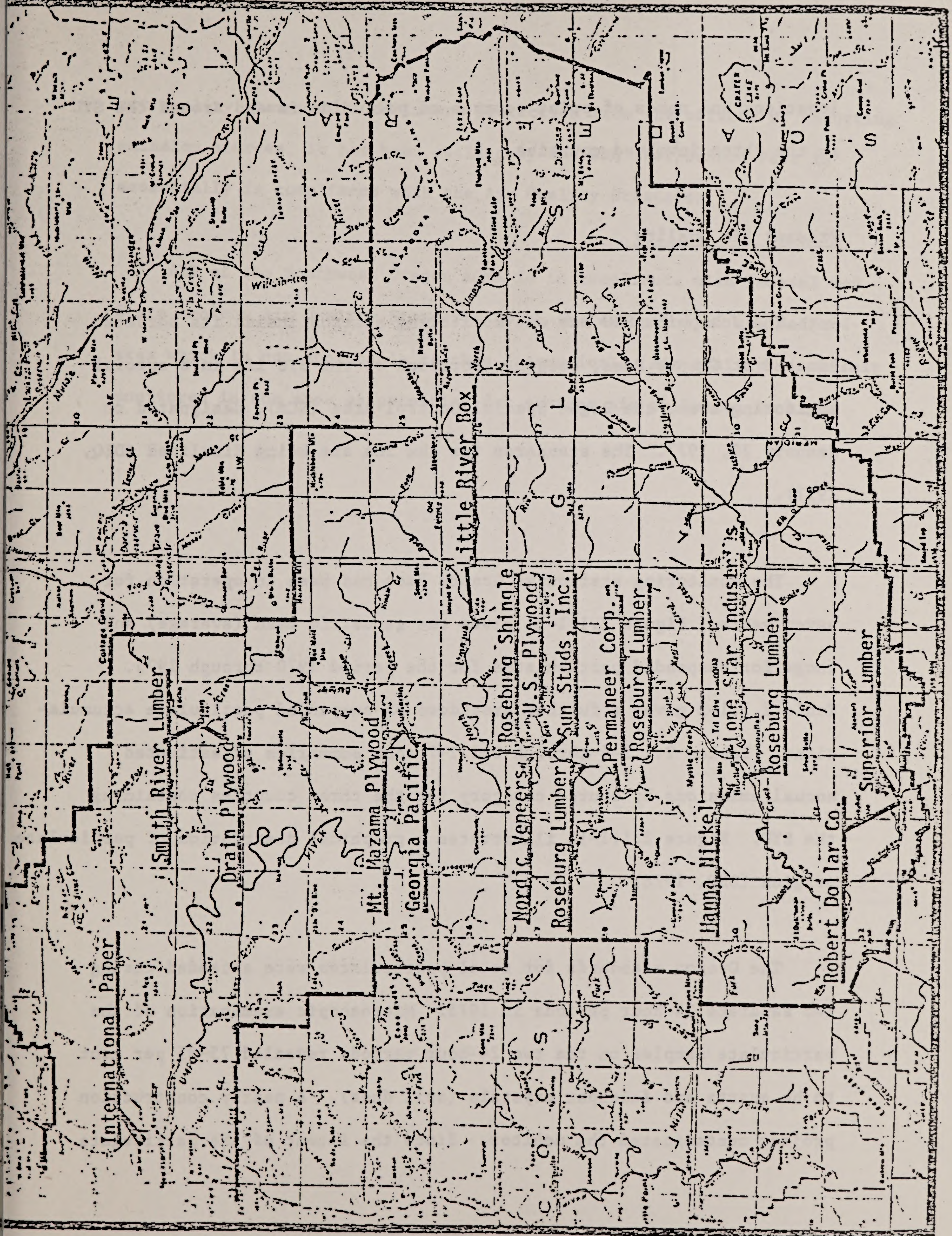
(SOURCE: DEQ, 1976)

Jackson County - Major Sources



(SOURCE: DEQ, 1976)

FIGURE 2.1.1-10



(Source: DEQ, 1976)

locations and names of point sources of pollution in and around the SYU in the three involved counties.

Present Air Quality

The Josephine SYU has one monitoring station inside its borders located at Grants Pass, Oregon. Portions of the SYU lie in a special monitoring area, the Rogue Special Control Area (SCA), designated on January 28, 1977. The standards for the SCA are being finalized (DEQ, 1977).

The monitoring station at Grants Pass has been in operation for seven years. Figure 2.1.1-11 gives the geometric mean (average) and range for suspended particulates for the period 1970 through 1975. Table 2.1.1-3 gives a further breakdown of suspended particulate accumulations. Tables 2.1.1-4 through 2.1.1-7 show summaries of estimated annual emissions by source category for the three counties containing the SYU. Figure 2.1.1-12 illustrates a graphical description of particulate origins (DEQ, 1976).

The Oregon standards for total particulates were exceeded during two separate 24-hour periods in 1975. Microscopic examination of the particulate samples on the two 24-hour periods revealed 75-85 per cent to be quartz and feldspar crystals (soil dust). A nearby construction project contaminated the monitor. Since the intent of the particulate

air quality standard is to insure protection from the effects of recurring emission sources, it has been decided by the DEQ that Grants Pass is essentially in compliance with the Air Quality Standards.

All of the Southwest Oregon AQMA is in compliance with Federal and State Ambient Air Quality Standards (with the exception of the Medford area which is not applicable to this discussion). Air quality is closely monitored in the area as potential for serious air pollution is high.

Grants Pass Sampling Station
Geometric Mean and Range - Suspended Particulate

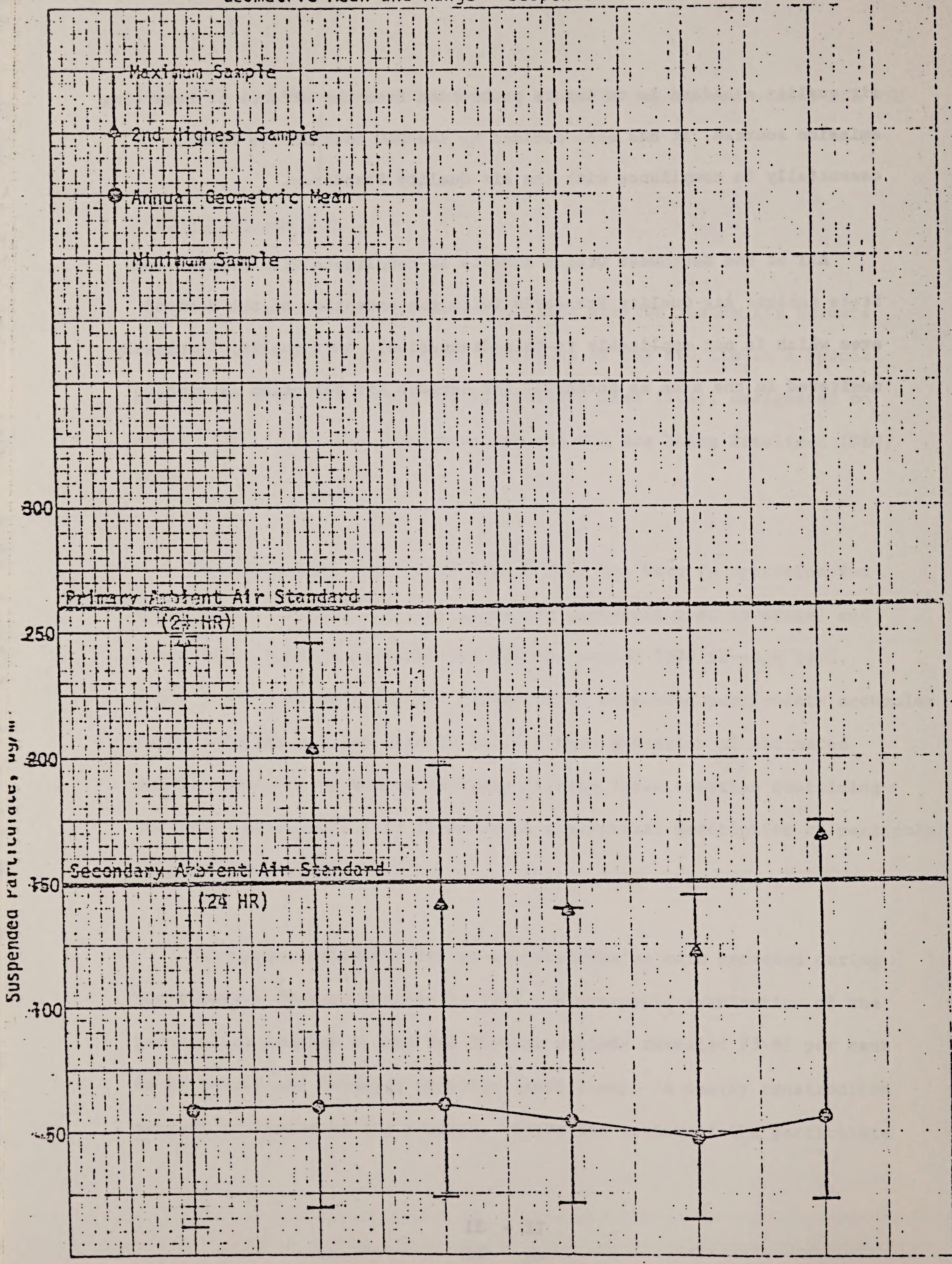


Table 2.1.1-3

Note: Available data was evaluated with respect to the National Ambient Air Quality Standards listed below:

Contaminant	Federal Standards	
	Primary (Health)	Secondary (Welfare)
Suspended Particulate	(1) 75 ug/m^3 annual geometric mean	(1) 60 ug/m^3 annual geometric mean
	(2) 260 ug/m^3 maximum 24 hr. concentration*	(2) 150 ug/m^3 maximum 24 hr. concentration*

*Not to be exceeded more than once/year

Ambient Air Sampling Data
Suspended Particulate, ug/m^3
(24 hr. sample)

Site	Year							
Ashland 1502105	1970	0	0	47.2	13	118	104	107
	1971	3	0	37.0	20	237	215	110
	1972	0	0	53.7	16	125	114	87
	1973	0	0	48.3	18	127	117	51
	1974	0	0	49.5	8	105	86	44
	1975	1	0	50.7	17	170	123	58
Coos Bay 0607101	1970	1	0	51.7	16	152	129	89
	1971	1	0	53.6	14	185	137	49
	1972	0	0	44.9	16	108	101	81
	1973	1	0	50.1	21	164	123	56
	1974	0	0	47.9	15	127	111	52
	1975	0	0	37.1	13	95	93	59
Grants Pass 1707105	1970	4	0	58.0	13	249	247	103
	1971	3	0	59.1	19	246	204	87
	1972	1	0	61.3	24	197	141	75
	1973	0	0	53.8	22	140	139	41
	1974	0	0	48.4	15	145	123	46
	1975	2	0	56.8	22	179	173	47
Medford 1520117	1969	11	1	—	32	301	235	75
	1970	13	1	76.6	16	298	208	170
	1971	5	0	78.9	21	226	222	84
	1972	7	0	83.4	23	207	192	91
	1973	3	0	69.9	33	183	162	56
	1974	5	1	75.9	23	301	223	58
	1975	7	0	71.7	22	228	214	66
Roseburg 1027017	1970	3	0	50.6	15	231	223	106
	1971	2	0	51.2	17	185	180	98
	1972	2	0	59.3	21	222	162	88
	1973	4	0	52.9	16	233	181	58
	1974	4	1	64.7	16	263	258	57
	1975	0	0	43.9	21	93	89	52

(Source: DEQ 1976)

Table 2.1.1-4

SUMMARY OF ESTIMATED ANNUAL EMISSIONS (TONS/YEAR) BY SOURCE CATEGORY

*** SOUTHWEST OREGON INTRASTATE AIR QUALITY CONTROL REGION ***

TOTAL PARTICULATES

SOURCE CATEGORY	TONS/YEAR
A. FUEL COMBUSTION SOURCES:	
1. RESIDENTIAL FUEL COMBUSTION	116
2. COMMERCIAL FUEL COMBUSTION	164
3. INDUSTRIAL FUEL COMBUSTION	8,507
TOTAL FUEL COMBUSTION	8,789
B. PROCESS LOSS SOURCES:	
1. CHEMICAL INDUSTRIES	8
2. FOOD/AGRICULTURE INDUSTRIES	84
3. METALLURGICAL INDUSTRIES	927
4. MINERAL PRODUCTS INDUSTRIES	168
5. PETROCHEMICAL INDUSTRIES	0
6. WOOD PROCESSING INDUSTRIES	5,562
7. OTHER INDUSTRIES	0
TOTAL PROCESS LOSS	6,752
C. TRANSPORTATION SOURCES:	
1. MOTOR VEHICLES	1,877
2. OFF-HIGHWAY FUEL USE	121
TOTAL TRANSPORTAION	1,998
D. SOLID WASTE SOURCES:	
1. INCINERATION	11
2. OPEN BURNING	120
3. WIGWAM WASTE BURNERS	900
TOTAL SOLID WASTE	1,033
E. MISCELLANEOUS AREA SOURCES:	
1. FIELD BURNING	4
2. FOREST FIRES	2,375
3. SLASH BURNING	6,585
4. OTHER	305
TOTAL MISCELLANEOUS	9,269
SUMMARY BY SOURCE CLASS:	
1. AREA SOURCES	11,556
2. POINT SOURCES	16,286
TOTAL OF ALL SOURCES	[illegible]

(Source: DEQ)

Table 2.1.1-5

SUMMARY OF ESTIMATED ANNUAL EMISSIONS (TONS/YEAR) BY SOURCE CATEGORY

DOUGLAS COUNTY

TOTAL PARTICULATES

SOURCE CATEGORY	TONS/YEAR
A. FUEL COMBUSTION SOURCES:	
1. RESIDENTIAL FUEL COMBUSTION	33
2. COMMERCIAL FUEL COMBUSTION	42
3. INDUSTRIAL FUEL COMBUSTION	3,018
TOTAL FUEL COMBUSTION	3,094
B. PROCESS LOSS SOURCES:	
1. CHEMICAL INDUSTRIES	0
2. FOOD/AGRICULTURE INDUSTRIES	2
3. METALLURGICAL INDUSTRIES	927
4. MINERAL PRODUCTS INDUSTRIES	96
5. PETROCHEMICAL INDUSTRIES	0
6. WOOD PROCESSING INDUSTRIES	1,993
7. OTHER INDUSTRIES	0
TOTAL PROCESS LOSS	3,020
C. TRANSPORTATION SOURCES:	
1. MOTOR VEHICLES	684
2. OFF-HIGHWAY FUEL USE	57
TOTAL TRANSPORTAION	741
D. SOLID WASTE SOURCES:	
1. INCINERATION	8
2. OPEN BURNING	4
3. WIGWAM WASTE BURNERS	278
TOTAL SOLID WASTE	290
E. MISCELLANEOUS AREA SOURCES:	
1. FIELD BURNING	0
2. FOREST FIRES	1,431
3. SLASH BURNING	2,942
4. OTHER	61
TOTAL MISCELLANEOUS	4,434
SUMMARY BY SOURCE CLASS:	
1. AREA SOURCES	5,258
2. POINT SOURCES	6,323
TOTAL OF ALL SOURCES	11,582

Source: DEQ

Table 2.1.1-6

MARY OF ESTIMATED ANNUAL EMISSIONS (TONS/YEAR) BY SOURCE CATEGORY

JACKSON COUNTY

TOTAL PARTICULATES

SOURCE CATEGORY	TONS/YEAR
A. FUEL COMBUSTION SOURCES:	
1. RESIDENTIAL FUEL COMBUSTION	37
2. COMMERCIAL FUEL COMBUSTION	56
3. INDUSTRIAL FUEL COMBUSTION	2,648
TOTAL FUEL COMBUSTION	2,742
B. PROCESS LOSS SOURCES:	
1. CHEMICAL INDUSTRIES	8
2. FOOD/AGRICULTURE INDUSTRIES	80
3. METALLURGICAL INDUSTRIES	0
4. MINERAL PRODUCTS INDUSTRIES	31
5. PETROCHEMICAL INDUSTRIES	0
6. WOOD PROCESSING INDUSTRIES	2,178
7. OTHER INDUSTRIES	0
TOTAL PROCESS LOSS	2,298
C. TRANSPORTATION SOURCES:	
1. MOTOR VEHICLES	526
2. OFF-HIGHWAY FUEL USE	24
TOTAL TRANSPORTAION	551
D. SOLID WASTE SOURCES:	
1. INCINERATION	2
2. OPEN BURNING	0
3. WIGWAM WASTE BURNERS	344
TOTAL SOLID WASTE	347
E. MISCELLANEOUS AREA SOURCES:	
1. FIELD BURNING	4
2. FOREST FIRES	165
3. SLASH BURNING	2,213
4. OTHER	196
TOTAL MISCELLANEOUS	2,579
SUMMARY BY SOURCE CLASS:	
1. AREA SOURCES	3,225
2. POINT SOURCES	5,293
TOTAL OF ALL SOURCES	8,519

(Source: DEQ 1976)

Table 2.1.1-7

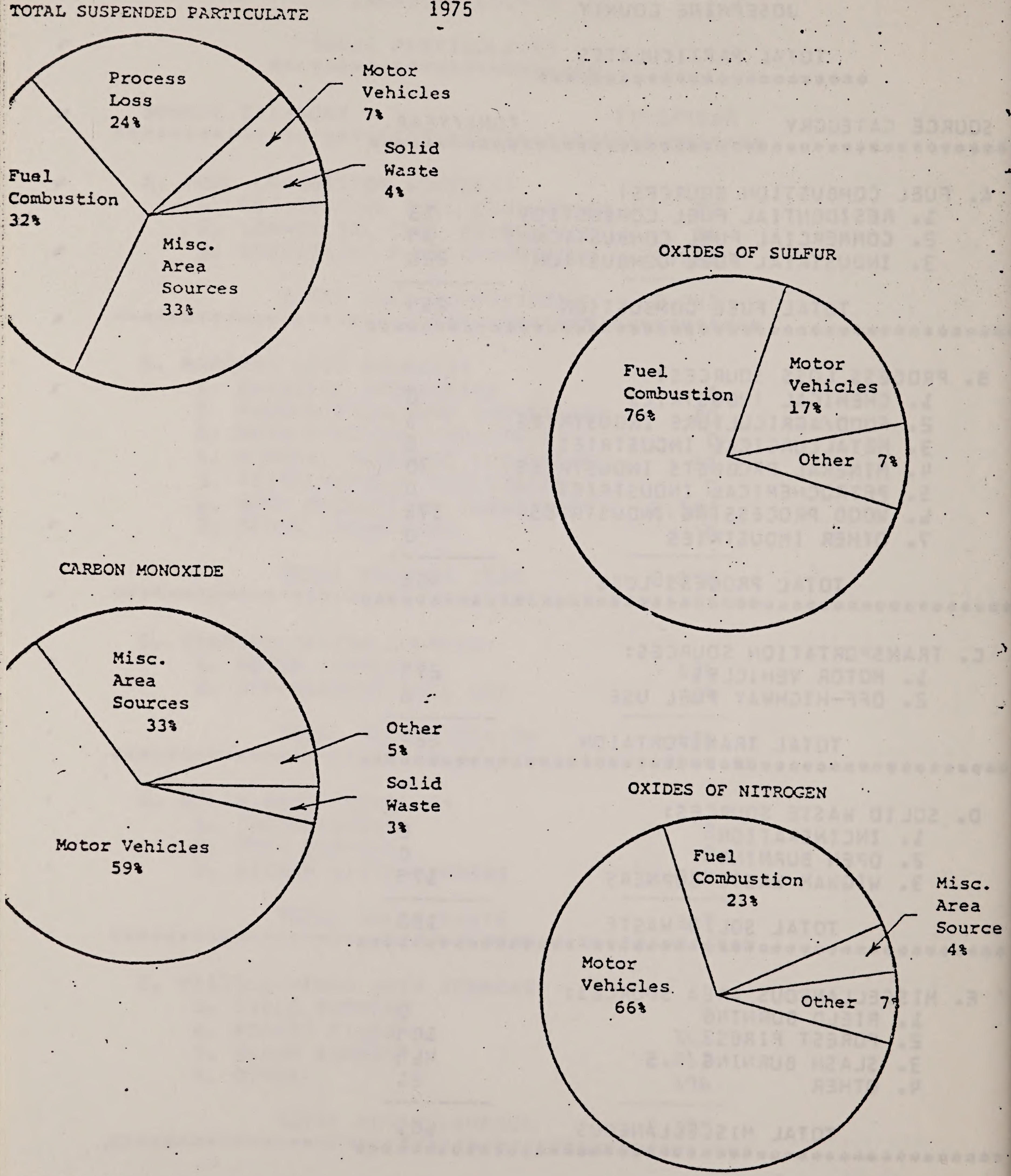
SUMMARY OF ESTIMATED ANNUAL EMISSIONS (TONS/YEAR) BY SOURCE CATEGORY

JOSEPHINE COUNTY

TOTAL PARTICULATES

SOURCE CATEGORY	TONS/YEAR
A. FUEL COMBUSTION SOURCES:	
1. RESIDENTIAL FUEL COMBUSTION	13
2. COMMERCIAL FUEL COMBUSTION	19
3. INDUSTRIAL FUEL COMBUSTION	226
TOTAL FUEL COMBUSTION	259
B. PROCESS LOSS SOURCES:	
1. CHEMICAL INDUSTRIES	0
2. FOOD/AGRICULTURE INDUSTRIES	1
3. METALLURGICAL INDUSTRIES	0
4. MINERAL PRODUCTS INDUSTRIES	30
5. PETROCHEMICAL INDUSTRIES	0
6. WOOD PROCESSING INDUSTRIES	376
7. OTHER INDUSTRIES	0
TOTAL PROCESS LOSS	408
C. TRANSPORTATION SOURCES:	
1. MOTOR VEHICLES	279
2. OFF-HIGHWAY FUEL USE	8
TOTAL TRANSPORTAION	287
D. SOLID WASTE SOURCES:	
1. INCINERATION	0
2. OPEN BURNING	0
3. WIGWAM WASTE BURNERS	179
TOTAL SOLID WASTE	180
E. MISCELLANEOUS AREA SOURCES:	
1. FIELD BURNING	0
2. FOREST FIRES	109
3. SLASH BURNING	469
4. OTHER	21
TOTAL MISCELLANEOUS	601
SUMMARY BY SOURCE CLASS:	
1. AREA SOURCES	924
2. POINT SOURCES	813
TOTAL OF ALL SOURCES	1,737

Figure 2.1.1-12
PERCENTAGE OF EMISSIONS FROM MAJOR SOURCES
SOUTHWEST OREGON INTRASTATE AIR QUALITY CONTROL REGION
1975



ce: DEQ 1976

Geology and Topography

The geology of the Josephine SYU is very complex. There are many formations of very different rock types arranged in such a manner to make interpretation very difficult. Much metamorphism (alteration of rock structure by heat and/or pressure) has occurred (McKee, 1973).

Two types of rock present in the SJYU contribute to special problems in the timber management program. Serpentine is an altered (metamorphic) product of ultrabasic igneous rocks (volcanic rocks high in iron and magnesium) which has been squeezed into faults, joints, and extrusions. Stunted vegetation and poor soil stability are characteristics of serpentine areas. Granitic rocks occur in the SJYU as large intruded masses. Weathered granite forms a very unstable material (gneiss) which is very prone to avalanche failure. Figure 2.1.1-13 illustrates the location of the granitic and serpentine areas in the JSYU (Burroughs et. al., 1975).

The topography of the Josephine SYU is divided into two distinct types. Level or gently rolling valley floors of the Rogue River and the Illinois River have formed on alluvium (water deposited sediment). These areas are sometimes referred to as "interior valleys" of south-western Oregon. These valleys average 1000 feet above sea level.

The uplands above the river valleys are deeply dissected, mountainous ridges cut by a dendritic (tree-shaped) drainage pattern. These ridges average 5000 feet above sea level, with height decreasing from south to

north. Drainage of the smaller streams is without clear trend; the larger streams flow north and west (Franklin et. al., 1973).

The Josephine SYU lies in the Klamath Mountains geographic province. Various portions of the SYU lie in the Siskiyou Mountains, a sub-part of the Klamath Mountains without clear geographic boundary (Hunt, 1974). Figure 2.1.1-14 illustrates the topographic relief of the Josephine SYU and vicinity.

Mineral Resources

The granitic rocks contain a large proportion of the many mineral resources of the area. Old mines and prospects are common in the Josephine SYU. The principal metals produced have been gold, nickel, chromium, astimony, copper, iron, mercury, platinum, silver, tungsten, and zinc. Much of the ore-bearing rock lies on the margins of intrusive granitic rocks. Nickel and chromium are found associated with the serpentine deposits. Non-metallic mineral resources include asbestos, barite, garnet, and limestone (McKee, 1973). Also important is the sand and gravel resource, for building material and road bases.

Placer and lode mining for gold has occurred since the "forty-niner" days. Many of the streams still bear the marks of gravel piles from placer mining over a century ago.

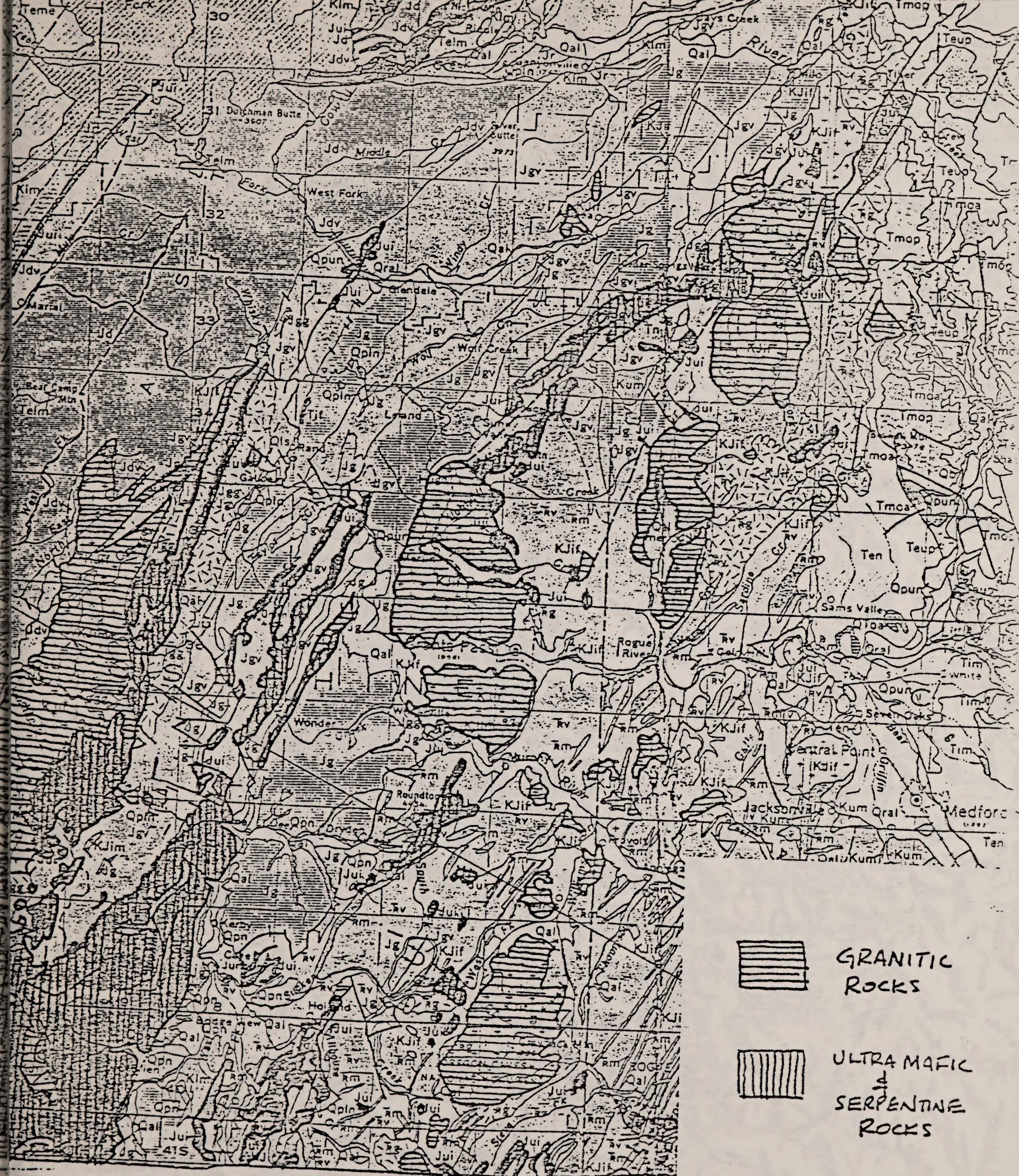
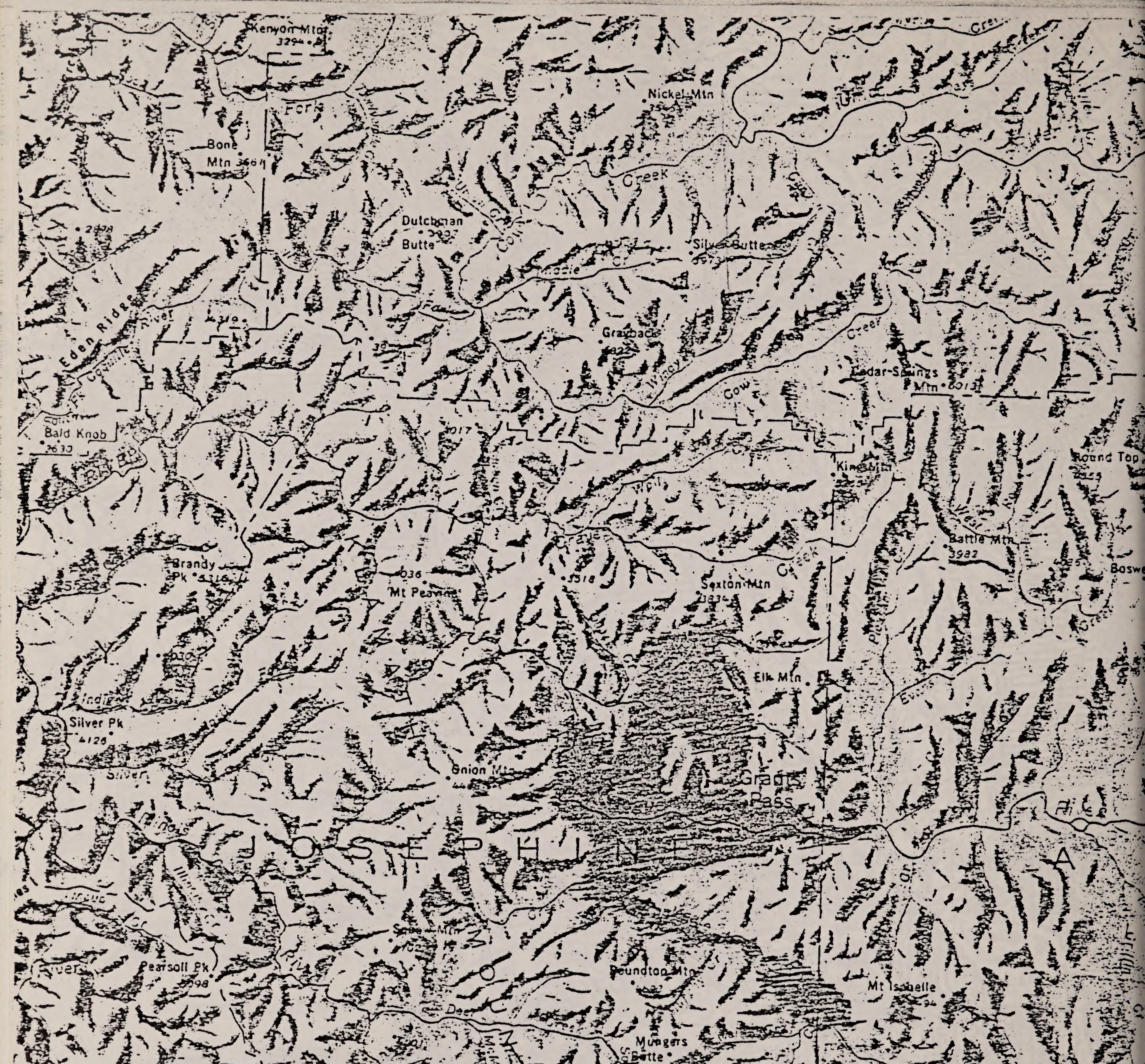


FIGURE 2.1.1.- 13
LOCATION OF GRANITIC AND SERPENTINITIC ROCKS IN THE JOSEPHINE SYU AND VICINITY
SOURCE: USGS, 1961



INTERIOR VALLEYS ON ~~[illegible]~~ ALLUVIUM SOURCE: USG[S] 196[.]

FORESTED RESIDUAL UPLANDS

FIGURE: 2.1.1-14 TOPOGRAPHY OF THE JOSEPHINE A SYU

Soils

Much of the information used in the development of this section was obtained from "Soil Inventory of the Medford District" by DeMoulin, et. al., 1975. Data are referenced to this and all other sources used.

The soils of the Josephine SYU are all characteristic of warm dry summers and cool, wet winters of a Mediterranean climate (DeMoulin, et.al., 1975). The highly variable soil pattern follows the complex geology of the Klamath Mountains. The most prevalent parent materials (geologic surface deposit on which soil develops) are sedimentary and metamorphic rocks which give rise to soils ranging from shallow and stony to deep and well developed. Surface textures are generally silt loam; and B horizons, when present, are usually silty clay loam or silty clay. Soils formed in periodite and serpentine are invariably bright red and fine-textured. Despite the presence of clay-textured B horizons, the soils are seldom deeper than 60 inches. Soils formed in granitic parent materials are generally of sandy texture and low fertility. In many areas, weathered material is deep; soil formation (alluviation) is well advanced. Metavolcanic and metasedimentary rocks develop a wide variety of soils. Well developed soils are generally brown with loamy surface horizons and clay loam subsoils (Franklin, et.al., 1973).

Soil Classification and Properties

Table 2.1.1-8 identifies the soils present on the Josephine SYU, their properties, and interpretations. Table 2.1.1-9 identifies the

acreage of soil mapping units and the totals of areas mapped. Map symbol means the number corresponding to the defined series (soils with profiles almost alike). Mean elevation gives the range in which the series is found. The precipitation zone gives the range of mean annual precipitation in which the series is found. The classification refers to the taxonomic description of the soil (see Appendix II for a brief description of the taxonomic system). Positon on the landform refers to the topographical setting in which the soil is found. Parent material refers to the geologic surface deposit on which the soil has formed. Texture refers to the relative per cent of sand, silt, and clay in the soil; surface soils often have different textures from subsoil. Dominant slope gives the range in per cent of slopes on which the soil is found. Aspect gives the direction a slope faces. Coarse fragments refers to the type and percentage of coarse fragments present in the soil. Profile depth gives the depth to parent material. Permeability of the soil is defined as:

Very Rapid	Over 10 inches per hour
Rapid	5 - 10
Moderately Rapid	2.5 - 5
Moderate	0.8 - 2.5
Moderately slow	0.2 - 0.8
Slow	0.05 - 0.2
Very Slow	Less than 0.05 inches per hour

Table 2.1.1-8
Soils of the Josephine Master Unit and Their Properties and Interpretations

Map Sym.	Mean Elev. (feet)	Precip. Zone (in.)	Classification Subgroup- -Family- -Series	Position on Landform	Parent Material	Texture Surface Soil Sub-Soil	Dominant Slope Range %	Aspect	Coarse Fragments Kind & %	Profile Depth (in.)	Permeability	Compaction Hazard	Drainage	Avail. H^2O Holding capacity (in.)	Major Limitation
						Soil Characteristics					**Soil Qualities and Interrelations**				
1			miscellaneous land type	flood plains of old Stream Terraces	holocene alluvium	-	-	-	-	-	-	-	-	-	--
R			miscellaneous land type	rock outcrop	-	-	-	-	-	-	-	-	-	-	----
370	1500-4000	35-70	Dystric Xerochrepts loamy-skeletal, mixed, mesic- -unnamed	mt.'ous slopes	collu-vium	GL / L	10-85+	N. if below 2500 ft	gravel 35-75	40+	M	M	well drained	3-6	-steep
371	1500-4000	35-70	Typic Xerochrepts- loamy-skeletal over fragmental, mixed, mesic- -unnamed	mt.'ous slopes	collu-vium	VGL / L	35-85+	N. if below 2500 ft	gravel 35-75	20-40	M	slight	well drn'd	3-6	-droughty -steep
372	1500-4000	35-80	Lithic Xerochrepts- Loamy-skeletal, mixed, mesic- -unnamed	mt.'ous slopes	collu-vium	GL / VGCL	35-85+	N. if below 2500 ft	gravel 35-70	0-12	M	slight	well drn'd	-3	-droughty -steep -shallow
(380)	1500-4000	35-80	Typic Haploxerults- -fine, mixed, mesic- -Pollard	mt.'ous slopes	collu-vium	CL / C	35-60+	N. if below 2000 ft	gravel 5-35	40+	MS	severe	well drn'd	6-9	-compaction -steep -sediment
381	1500-4000	35-80	Typic Haploxerults -clayey skeletal, mixed, mesic- -unnamed	mt.'ous slopes	collu-vium	GCL / VGC	35-85	N. if below 2000 ft	gravel 35-75	20-40	MS	M severe	well dr'nd	3-6	-compaction -steep -sediment
382	1500-4000	35-80	Typic Haploxerults- -clayey-skeletal, mixed, mesic- -unnamed	mt.'ous slopes	collu-vium	GCL / VGCL	10-65	N. if below 2000 ft	gravel 35-75	40+	MS	M severe	well drn'd	3-6	-compaction -slumpage -erosion

(Source: DeMoulin, et. al., 1975)

Table 2.1.1-8 continued

						Soil Characteristics						Soil Qualities and Interrelations			
Map Sym.	Mean Elev. (feet)	Precip. Zone (in.)	Classification Subgroup- -Family- -Series	Position on Landform	Parent Material	Texture Surface Soil / Sub-Soil	Dominant Slope Range %	Aspect	Coarse Fragments Kind & %	Profile Depth (in.)	Permeability	Compaction Hazard	Drainage	Avail. H^2O Holding capacity (in.)	Major Limitation
701	1200-4000	20-35	Lithic Xerochrepts- -loamy skeletal, mixed, mesic- -unnamed	Mt.'ous slopes	collu-vium	VGL / VGL	35-85	South	gravel 35-70	12-20	M-M rapid	slight	some-what excess-ively drn'd	3	-droughty -erosion
712	1500-4000	30-50	Ultic Haploxerolfs- -fine, mixed, mesic- -Jumpoff	mt.'ous benched side-slopes	collu-vium	GCL / C	10-35	varies	gravel 10-35	40+	S-VS	severe	M well drn'd	3-6	-compaction -slumpage -erosion
(718)	1000-4000	20-35	Typic Xerocurepts- -loamy-skeletal, mixed, mesic- -Beekmon	mt.'ous slopes	collu-vium	VGL / VGL	35-85	S. if above 2500 ft	gravel 35-75	20-40	M	slight	well drn'd	3-6	-droughty -erosion
(719)	1500-3000	20-35	Typic Hapoxeralts- -fine, mixed, mesic- -Manzanita	alluvial fans & upland slopes	collu-vium	CL / C		S. if above 2500 ft	gravel 5-35	40+	MS	severe	well drn'd	6-8-9	-compaction -erosion
721	1200-4000	30-50	Typic Xerochrept- -coarse-loamy, mixed, mesic- -Siskiyou	Steep hills & Mtns.	Grani-tic collu-vium	sandy loam over G sandy loam	35-85	varies	gravel 5-35	20-40	M rapid	slight	some-what excess-ively drn'd.	3	-erosion -slumping
722	1200-3000	30-50	Ultic Haploxeralfs- -fine-loamy, mixed, mesic- -Holland	foot-slopes & allu-vial fans	gran-itic collu-vium	L / CL	3-35	varies	gravel 3-25	40+	MS	slight -Mod.	well	6-9	-erosion -slumping
770	1000-5000	25-60	Lithic Xerochrepts- -clayey skeletal, serpnetinitic, mesic- -Pearsoll	mt.'ous slopes	serpen-tinitic collu-vium	CL / cobbly clay	10-85	varies	gravel & cobbles 35-75	12-20	slow	M-severe	well drn'd	3	-fertility -erosion -sediment -droughty

(Source: DeMoulin, et. al., 1975)

Table 2.1.1-8 continued

Map Sym.	Mean Elev. (feet)	Precip. Zone (in.)	Classification Subgroup- -Family- -Series	Position on Landform	Material	Texture Surface Soil / Sub-Soil	Dominant Slope Range %	Aspect	Coarse Fragments Kind & %	Profile Depth (in.)	Permeability	Compaction Hazard	Drainage	Avail. H^2O Holding capacity (in.)	Major Limitation
						Soil Characteristics					Soil Qualities and Interrelations				
781	1000-4000	20-35	Typic Xerochrepts- -fine-loamy, mixed, mesic- -Colestine	mt.'our slopes	collu-vium	L / CL	35-60	S. if above 2500 ft	gravel 10-35	20-40	M	slight -mod.	well drn'd	3-6	-erosion -slumpage -regeneration
824	3500-6000	40-80	Dystric Xerochrepts- -loamy-skeletal over fragmental, mixed, frigid- -unnamed	mt.'ous slopes	collu-vium	VGL / VGL	5-85	N. if below 4000 ft	gravel 35-75	20-40	M	slight	well drn'd	3-6	-erosion -slumpage
825	3500-6000	40-80	Dystric Lithic Xerochrepts- -loamy-skeletal over fragmental, mixed, frigid- -unnamed	ridges & side-slopes	volcanic collu-vium	GL / C	5-80	N. if below 4000 ft	gravel 5-35	12-20	M-M rapid	slight	well drn'd	3	-shallow -erosion -regeneration

Key: C = clay, G = gravelly, L = loam, V = very; N = north, S = south; M = moderate, S = slow; drn'd = drained

(Source: DeMoulin, et. al., 1975)

Table 2IIA1-92
Soil Mapping Units and Acreages for
the Josephine Master Unit

Map Symbol	Acres BLM	Private	Total
1	4880	20160	25040
R	4620	500	5120
370-382-371/XW	5090	1720	6880
370-382-371/XWN	6850	1080	7930
370-382-371/XY	15270	8520	23790
370-382-371/XYn	29030	11780	40810
371-372-370/XY	55550	29540	85090
371-372-370/XYn	49520	25810	75330
372-371/Y	17860	4630	22490
372-371/Yn	31870	8250	40120
372-R/Y	19410	3900	23310
372-RYn	1460	1190	2650
380/W	5150	5280	10430
380-382/WX	10170	10260	20430
380-382/WXn	10720	7760	18480
381-380/X	12340	8190	20530
381-380/Xn	4240	2800	7040
381-380/XY	9830	6640	16470
381-380/XYn	4770	4590	9360
701-R/Y	2570	1140	3710
712/WX	4210	4400	8610
712/WXn	660	1640	2300
712-718/X	2340	1260	3600
712-718/Xn	1120	970	2090
718-710/XY	8130	2770	10900
718-701XYn	1330	1790	3120
718-701/Yn	2130	2010	4140
718-719/WX	2740	2270	5010
718-781/XY	11170	8840	20010
718-781/XYn	10430	4240	14670
719/VW	1210	4200	5410
719/W	1890	4480	6370
719/Wn	670	1320	1990
719/WX	2300	4230	6530
719/WXn	2140	0	2140
719-781/WX	2380	1310	3690
719-781/WXn	280	620	900
721/X	4050	2500	6550
721/Xn	1800	940	2740
721/XY	2660	640	3300
721/XYn	3900	3350	7250

(Source: DeMoulin, et. al., 1975)

Table 2.1.1-9 continued

Map Symbol	Acres BLM	Private	Total
721/Y	640	0	640
721/Yn	1940	0	1940
722/V	810	1870	2680
722/VW	2850	850	3700
722/W	500	530	1030
722/Wn	10	130	140
770-R/XY	26110	10760	36870
781-719/WX	1050	640	1690
781-719/WXn	420	110	530
781-719/XY	2990	3020	6010
781-719/XYn	2880	3860	6740
824-825/XY	2380	170	2550
824-825/XYn	9460	1970	11430
	425480	243940	669420

(Source: DeMoulin, et. al., 1975)

Compaction results from a decrease in size of soil pore space. The hazard to compaction depends on the force applied per unit area, texture, moisture content, and organic matter content. Drainage relates to the rate at which excess water will move through the soil profile. Available water holding capacity refers to that amount of water held between field capacity (gravitational saturation) and 15 bars of moisture tension (held against a pressure potential of 220 pounds per square inch tension). Available water is that moisture available to most plants. Major limitations refers to the management problem most represented by the soil.

Appendix one contains the several maps of the Medford District that encompass the Josephine SYU. Note that the series have been consolidated into associations, which represent regular occurring patterns of related soils. For a complete description of the soils of the Josephine SYU, the "Soil Survey of the Medford District" may be examined at the Medford District Office. Acreages of mapped soils do not correspond with acres total in the SYU as several large areas of private land inside the boundaries were not mapped.

Water Resources

Water resources in the Josephine SYU are within two major watersheds of southwest Oregon. The majority lie within the Rogue River watershed. The northern portion of the SYU lies in the Umpqua River watershed. The

water in the streams is of generally good quality on the whole (Columbia-North Pacific Region Comprehensive Framework Study). Mineral quality is good. Biological quality is variable.

All streams on the SYU have runoff peaks in January or February, corresponding to the period of maximum precipitation. Flow rates of the streams vary greatly. Seasonal variation in flow is great.

Ground water is obtained primarily from alluvial deposits in valleys. Uses of ground water include municipal, industrial, and agricultural consumption. Outside of the alluvial areas, ground water is found in small quantities in various formations underlying the unit. Wells outside the alluvial areas are few in number; those existing are mainly poor producers.

Runoff and Streamflow

Precipitation entering a forest ecosystem becomes part of the forest hydrologic cycle. Some precipitation is intercepted by the vegetation; evaporation of this intercepted water occurs at a rate decreasing in proportion to increasing relative humidity. The proportion of precipitation lost through evaporation depends on the intensity and duration of the storm event. A higher proportion of precipitation from larger storms reaches the ground in a forest ecosystem (Harr, 1976).

The precipitation reaching the soil surface infiltrates the soil profile. Infiltration capacities of soils in western Oregon often

exceed 150 cm/hour (59 inches/hour) (Dyrness, 1969, Ranken, 1974, Yee, 1975 in Harr 1976). Overland flow is virtually nonexistent; subsurface water movement accounts for nearly all streamflow in western Oregon (Harr, 1976).

Water in the soil is subject to uptake and transpiration (the evaporation of water from leaves) by forest vegetation and to evaporation from the soil surface. Evaporation from the surface is minimal under a forest cover due to the small amount of energy available for evaporation, the high relative humidity, and the reduced air movement near the ground. Transpiration is responsible for a large loss of water from the forest ecosystem. Water not returned to the atmosphere by evaporation or transpiration either moves downslope to maintain streamflow or percolates to ground water. Percolation of the rocks of the Josephine SYU is very slow due to low porosities; little recharge occurs (Columbia-North Pacific Region Comprehensive Framework Study). Since little water is held in rocks as ground water, runoff occurs mostly from soil water. Since the soil profiles can only retain a fraction of the total precipitation stream flow strongly reflects the seasonal nature of precipitation.

Figures 2.1.1-14 through 2.1.1-20 illustrate the mean monthly discharge for the major drainages of the Josephine SYU. Note the extreme variation between peak discharge in late winter and minimum flow in early fall. Also note the wide disparity between the extremes and the average discharge. Figures 2.1.1-21 through 2.1.1-27 illustrate the annual discharges for the identical streams for 15 years ending in water

year 1975. Note the wide variation in year to year flow totals. Variations in annual flow are the result of variations in snow pack depth, precipitation means, precipitation distribution with time, and temperature variations. Streamflow in southwest Oregon is extremely variable from month to month and year to year. Figure 2.1.1-28 gives locations for the gauging stations on the streams indicated.

Temperature

Temperature of water resources is an important factor in a forest ecosystem. Water temperature affects the amount of dissolved solids and gases present in a stream. Dissolved oxygen varies with temperature. The survival of salmonid embryos is related to dissolved oxygen concentrations of spawning streams (Ringler and Hall, 1975).

In a small, shaded stream, temperature varies directly with the amount of exposure to sunlight of the stream surface and indirectly with stream discharge (Brown, 1971). Since streams in the Josephine SYU reach their minimum discharge period during the summer period when air temperatures are at their peak, the effects of exposure of streams to direct sunlight are compounded. Table 2.1.1-12 shows temperatures of the Rogue River at Agness, Oregon for water year 1975. Table 2.1.1-15 gives temperatures for several streams in the Josephine SYU.

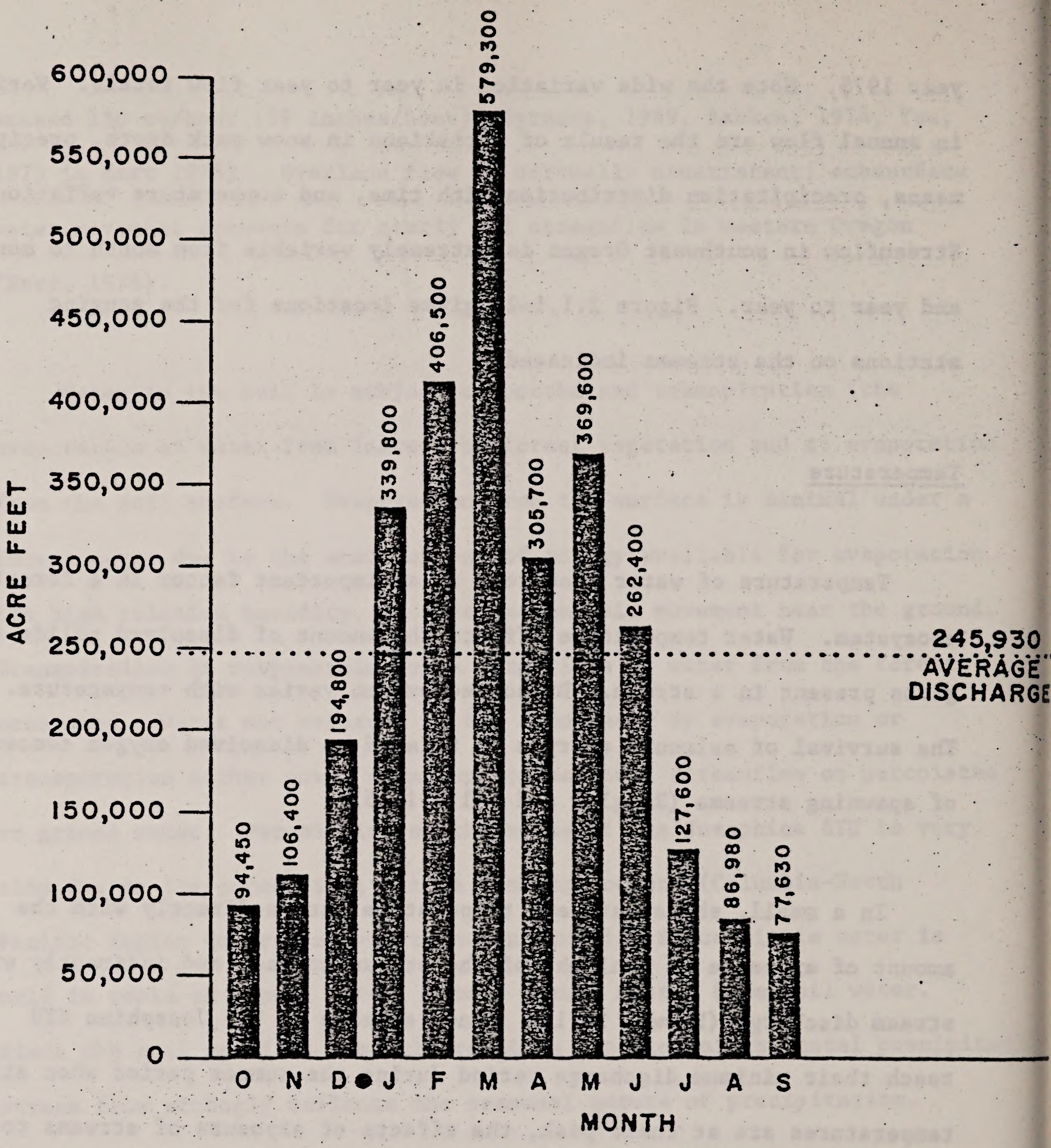


Figure 2.1.1-15 MEAN MONTHLY DISCHARGE FOR ROGUE RIVER AT GRANTS PASS, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge —— 2,592,000 Ac. Ft. (37 years record)
- Average Discharge, WY 1975 —— 2,951,000 Ac. Ft.
- Maximum Daily Discharge —— 152,000 Ft.^{3}/Sec. Dec. 23, 1964
- Minimum Daily Discharge —— 195 Ft.^{3}/Sec. Jan. 30, 1961
- Average Daily Discharge —— 35,780 Ft.^{3}/Sec. (37 years record)

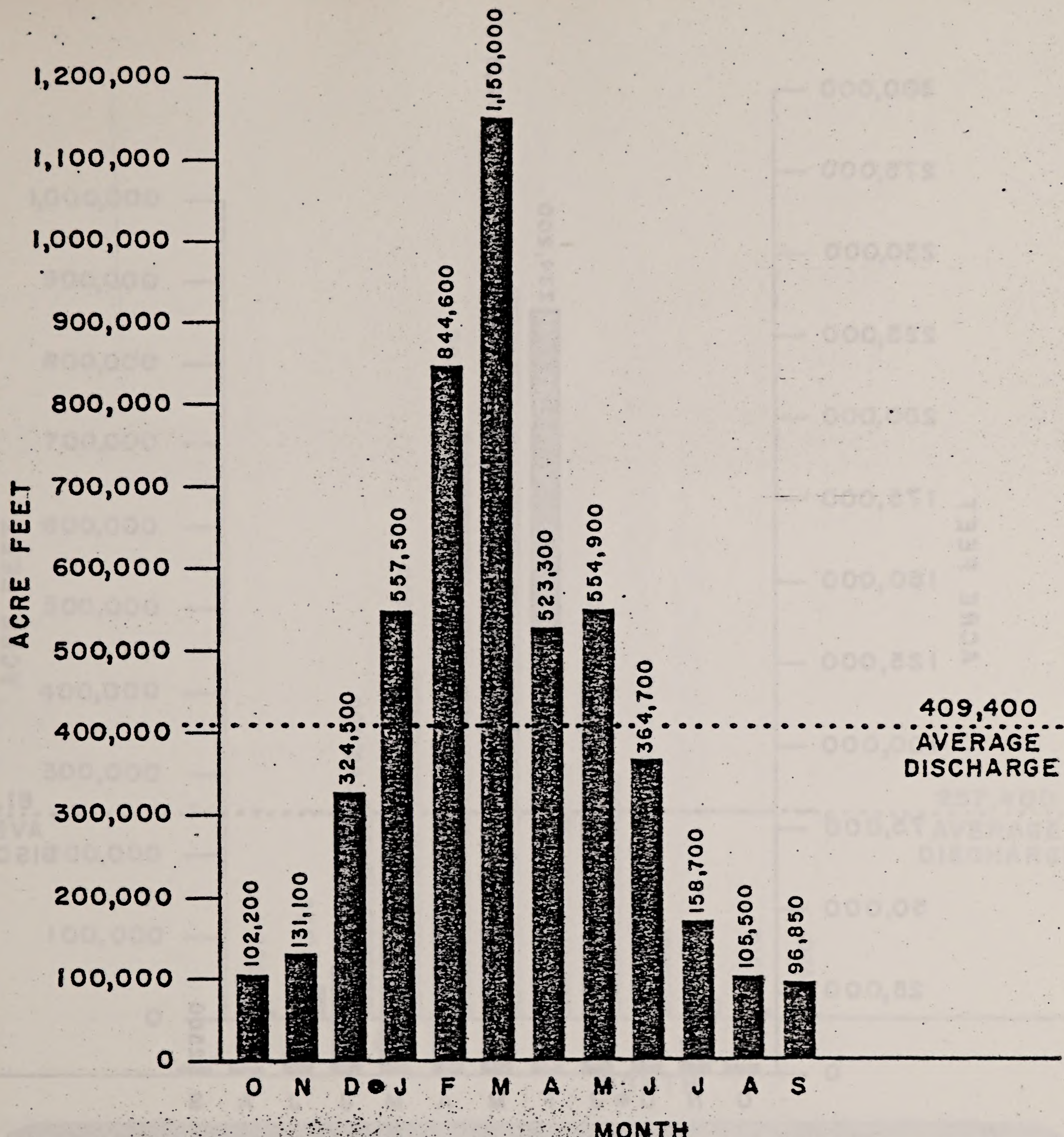


Figure 2.1.1-16 MEAN MONTHLY DISCHARGE FOR ROGUE RIVER NEAR AGNESS, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge —— 4,880,000 Ac. Ft. (15 years record)
- Average Discharge, WY 1975 —— 4,918,000 Ac. Ft.
- Maximum Daily Discharge —— 290,000 Ft.^{3}/Sec. Dec. 22, 1964
- Minimum Daily Discharge —— 608 Ft.^{3}/Sec. Jul. 9 & 10, 1968
- Average Daily Discharge —— 6,792 Ft.^{3}/Sec. (15 years record)

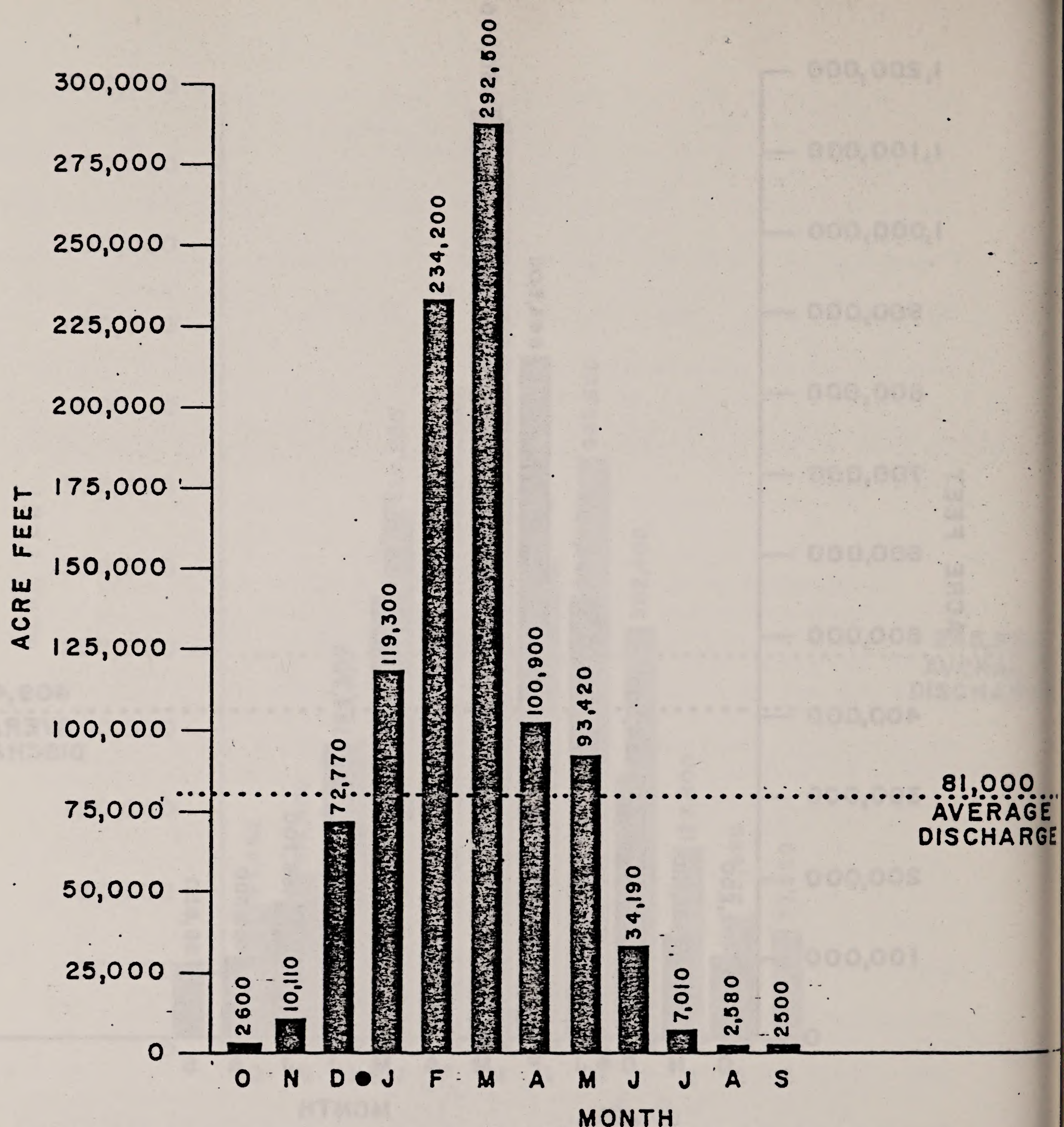


Figure 2.1.1-17 MEAN MONTHLY DISCHARGE FOR ILLINOIS RIVER NEAR KERBY, OREGON ● WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS: Average Annual Discharge—1,007,000 Ac. Ft. (14 years record)

Average Discharge, WY 1975—972,200 Ac. Ft.

Maximum Daily Discharge—30,000 Ft.^{3}/Sec. Dec. 22, 1964

Minimum Daily Discharge—18 Ft.^{3}/Sec. Aug. 23, 1973

Average Daily Discharge—1,390 Ft.^{3}/Sec. (14 years record)

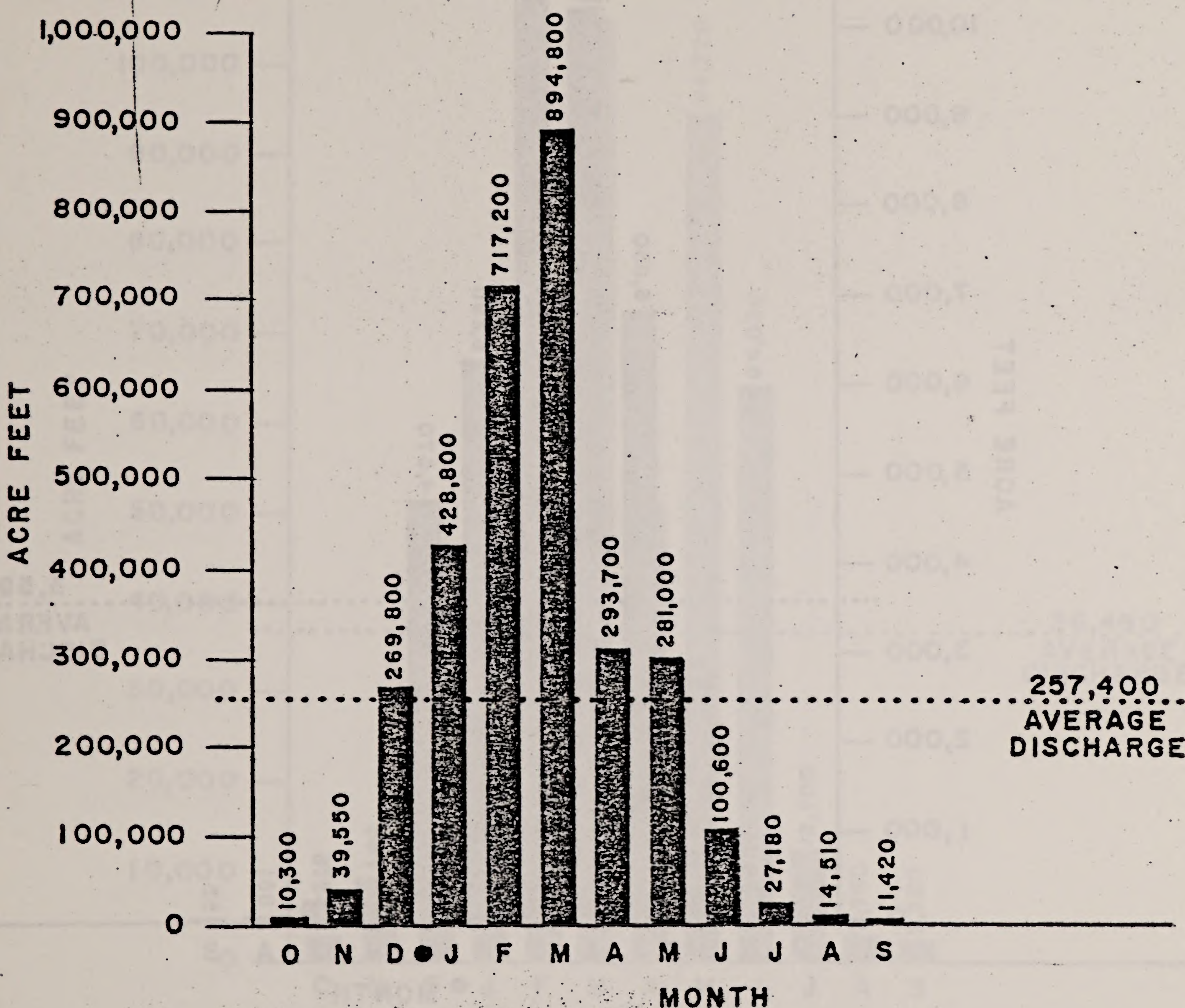


Figure 2.1.1-18 MEAN MONTHLY DISCHARGE FOR ILLINOIS RIVER NEAR AGNESS, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge (15 years record) — 3,311,000 Ac.Ft.
- Average Discharge, WY 1975 — 3,089,000 Ac.Ft.
- Maximum Daily Discharge Dec. 22, 1964 — 225,000 $Ft^3/Sec.$
- Minimum Daily Discharge Sep. 10, 11, & 17, 1972 and Sep. 16 & 17, 1973 — 130 $Ft^3/Sec.$
- Average Daily Discharge (15 years record) — 4,570 $Ft^3/Sec.$

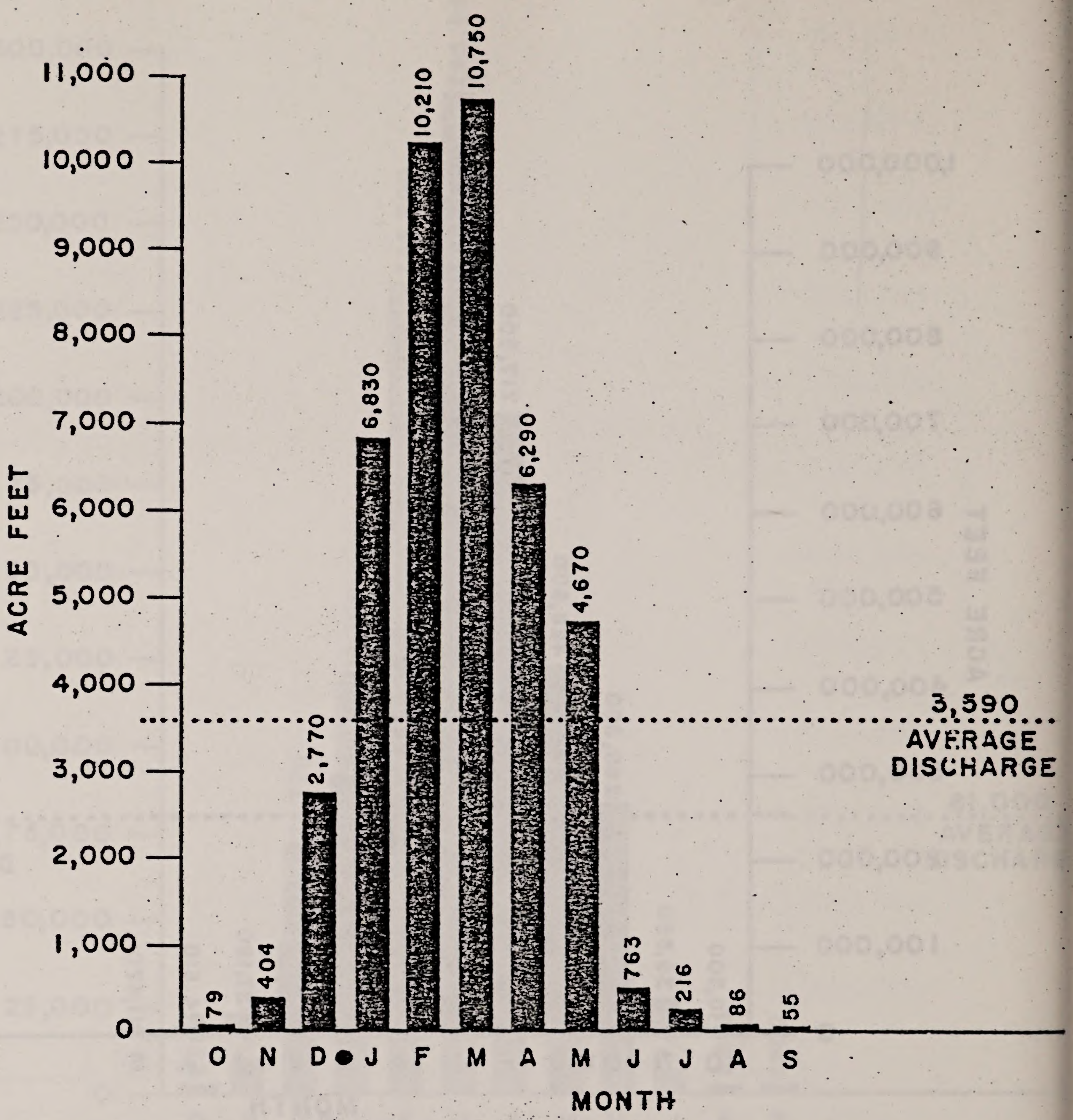


Figure 2.1.1-19 MEAN MONTHLY DISCHARGE FOR GRAVE CREEK AT PEASE BRIDGE NEAR PLACER, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge —— 44,630 Ac. .. (30 years record)
- Average Discharge, WY 1975 —— 43,120 Ac.Ft.
- Maximum Daily Discharge —— 6,240 $Ft.^3/Sec.$ Dec. 22, 1964
- Minimum Daily Discharge —— 0.12 $Ft.^3/Sec.$ Jul. 15, 1970
- Average Daily Discharge —— 61.6 $Ft.^3/Sec.$ (30 years record)

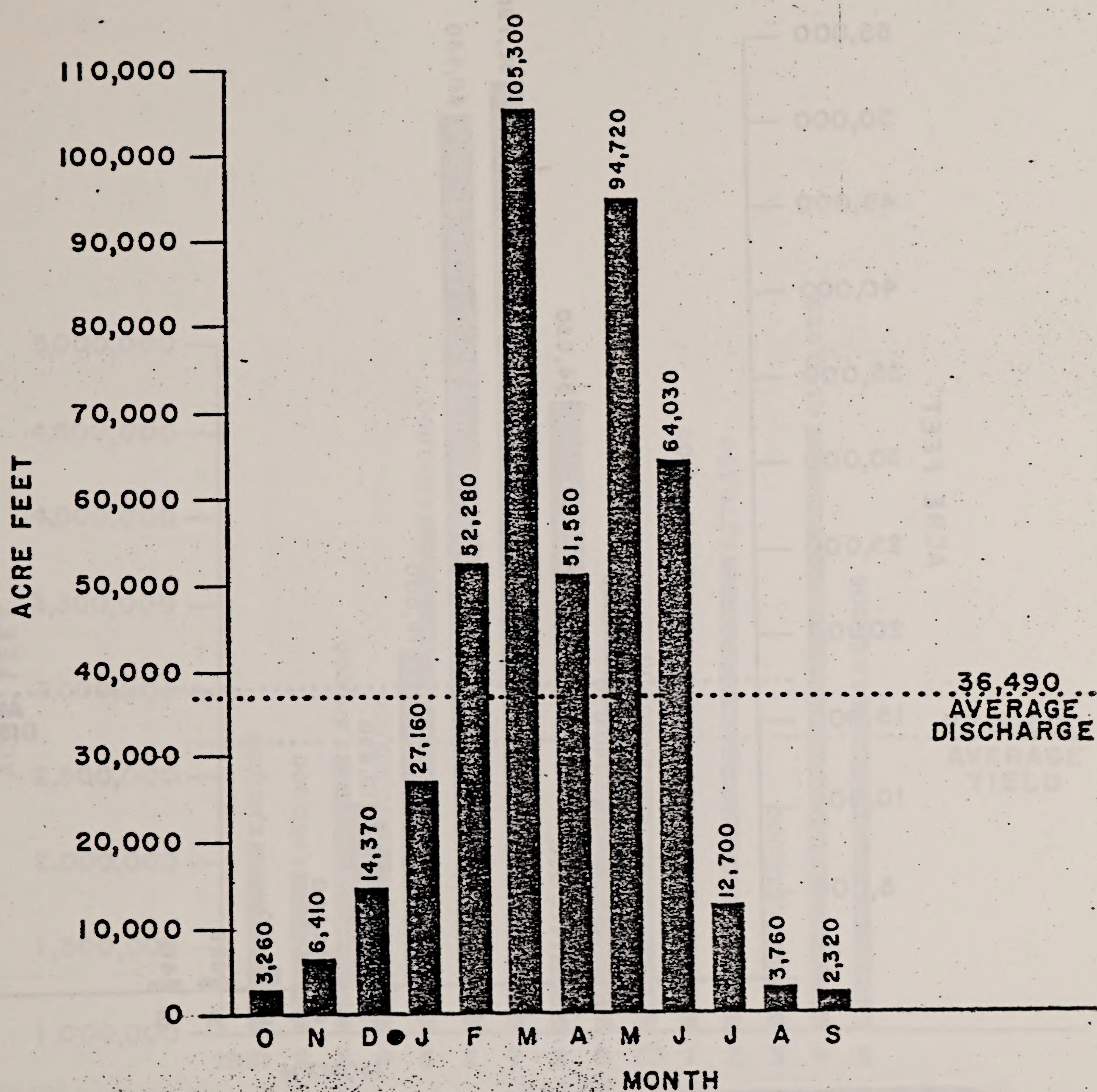


Figure 2.1.1-20 MEAN MONTHLY DISCHARGE FOR APPLEGATE RIVER NEAR APPLEGATE, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge (37 years record) — 413,700 Ac.Ft.
- Average Discharge, WY 1975 — 437,900 Ac.Ft.
- Maximum Daily Discharge Dec.22, 1964 — 45,700 $Ft^3/Sec.$
- Minimum Daily Discharge Sep. 15, 1960 — 7 $Ft^3/Sec.$
- Average Daily Discharge (37 years record) — 571 $Ft^3/Sec.$

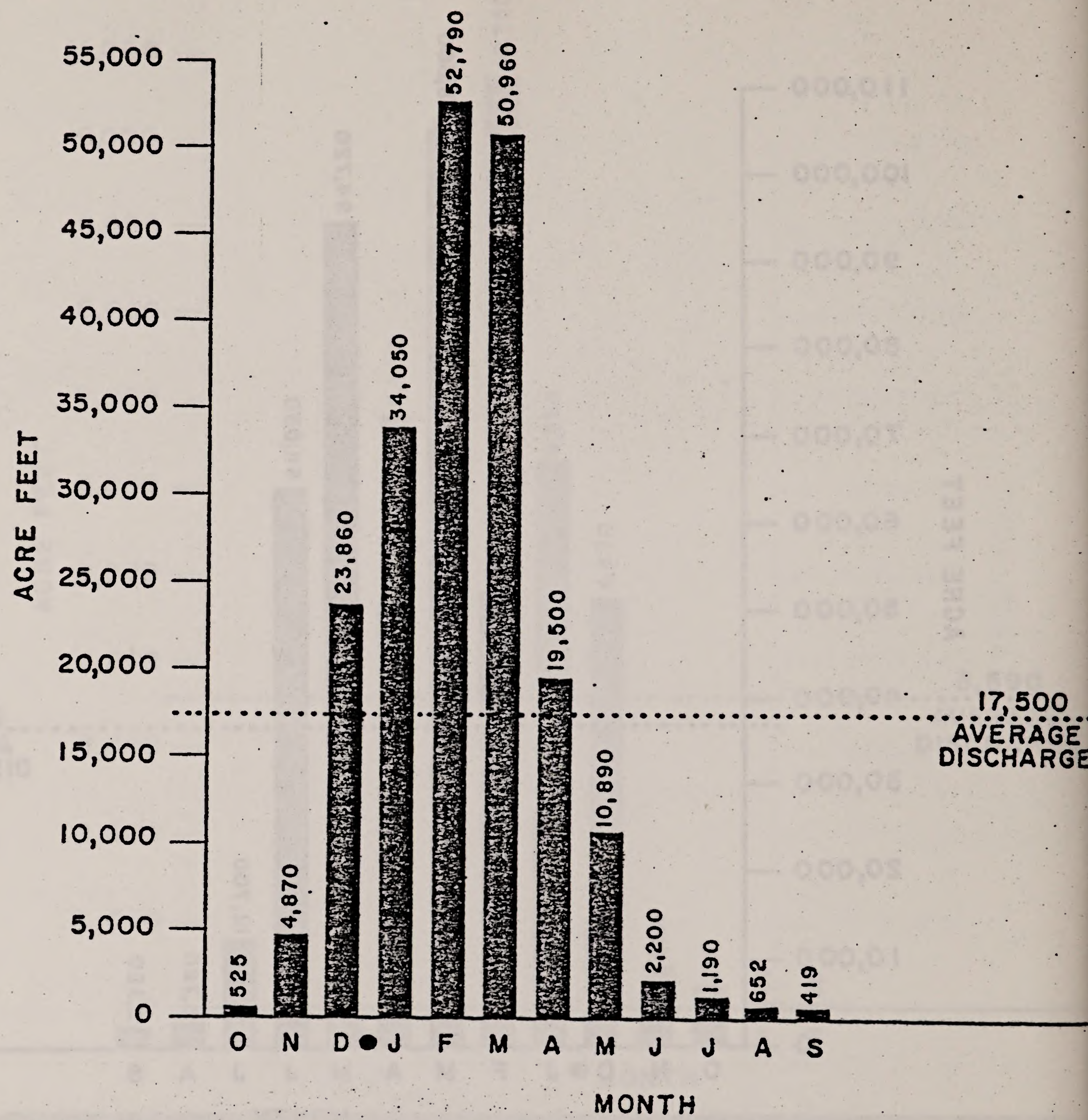


Figure 2.1.1-21 MEAN MONTHLY DISCHARGE FOR COW CREEK NEAR GLENDALE, OREGON • WATER YEAR 1975

SOURCE: Water Resources Data for Oregon, Water Year 1975

RECORDS:
- Average Annual Discharge (20 years record) — 210,800 Ac. Ft.
- Average Discharge, WY 1975 — 201,900 Ac. Ft.
- Maximum Daily Discharge Dec. 22, 1964 — 15,700 $Ft.^3/Sec.$
- Minimum Daily Discharge Sep. 23 & 24, 1975 — 5.9 $Ft.^3/Sec.$
- Average Daily Discharge (20 years record) — 291 $Ft.^3/Sec.$

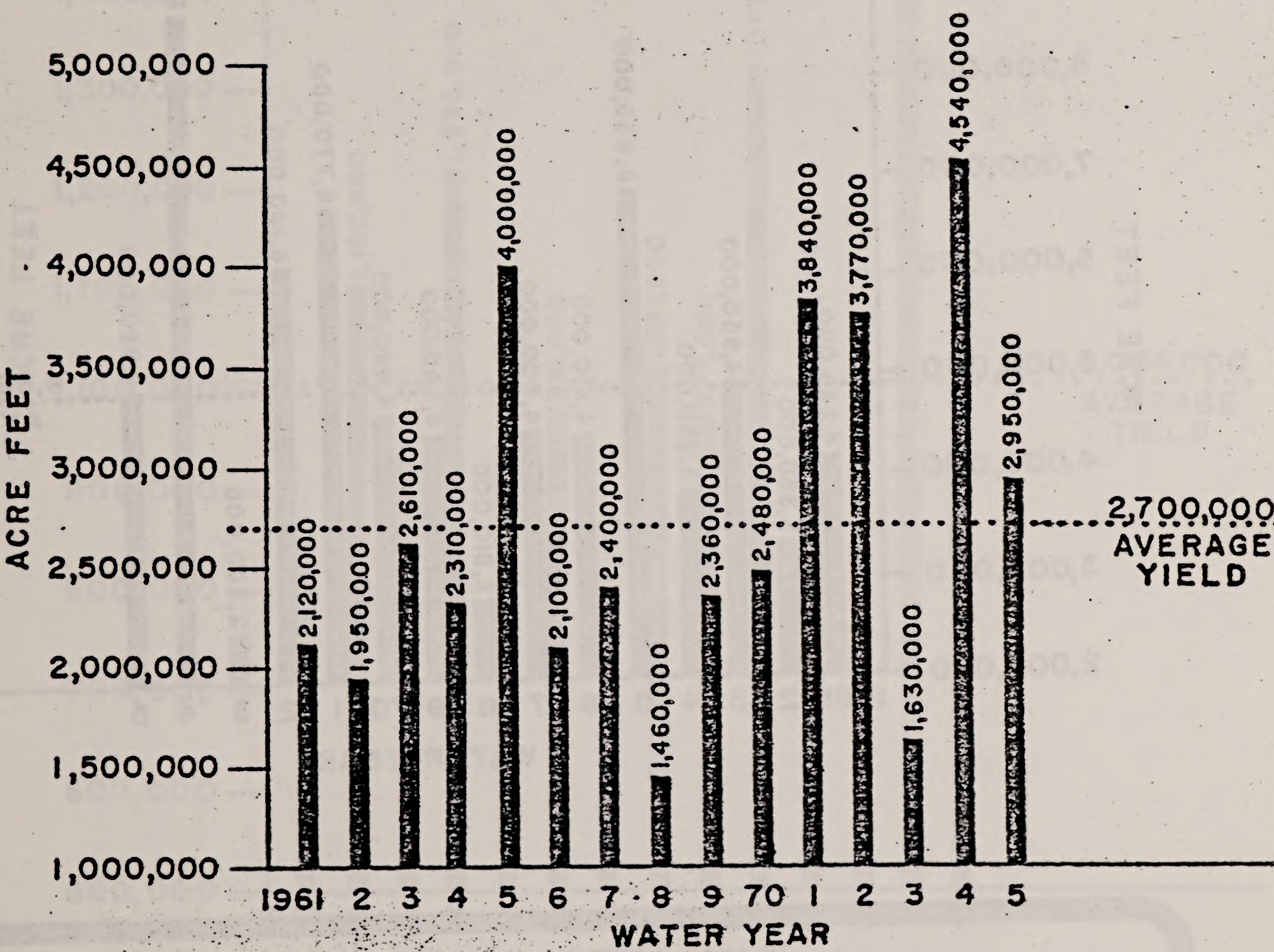


Figure 2.1.1-22 ANNUAL YIELD FOR ROGUE RIVER NEAR GRANTS PASS OREGON
SOURCE: USGS File Data

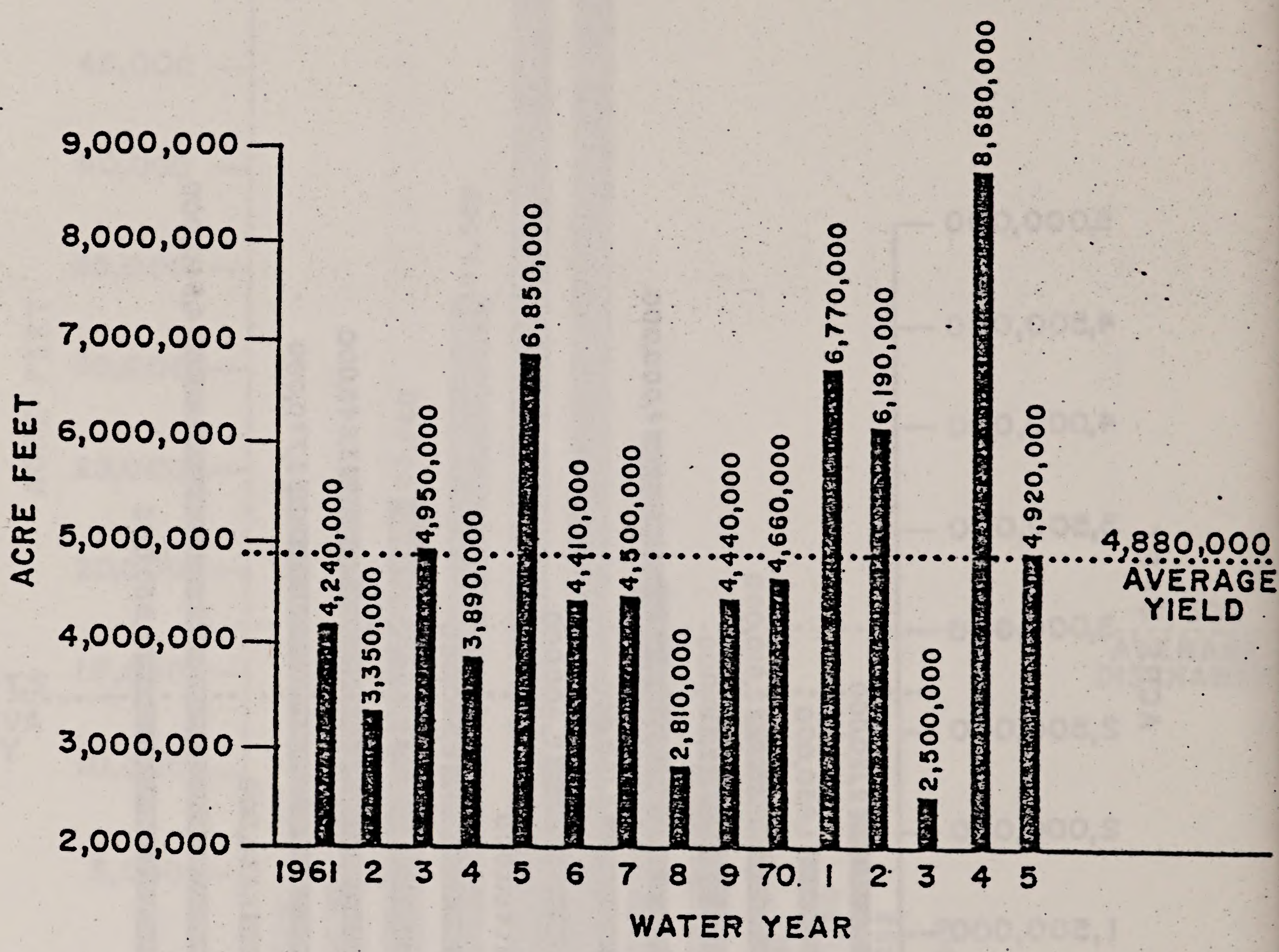


Figure 2.1.1-23 ANNUAL YIELD FOR ROGUE RIVER AT AGNESS, OREGON 1961 ● 1975

SOURCE: USGS File Data

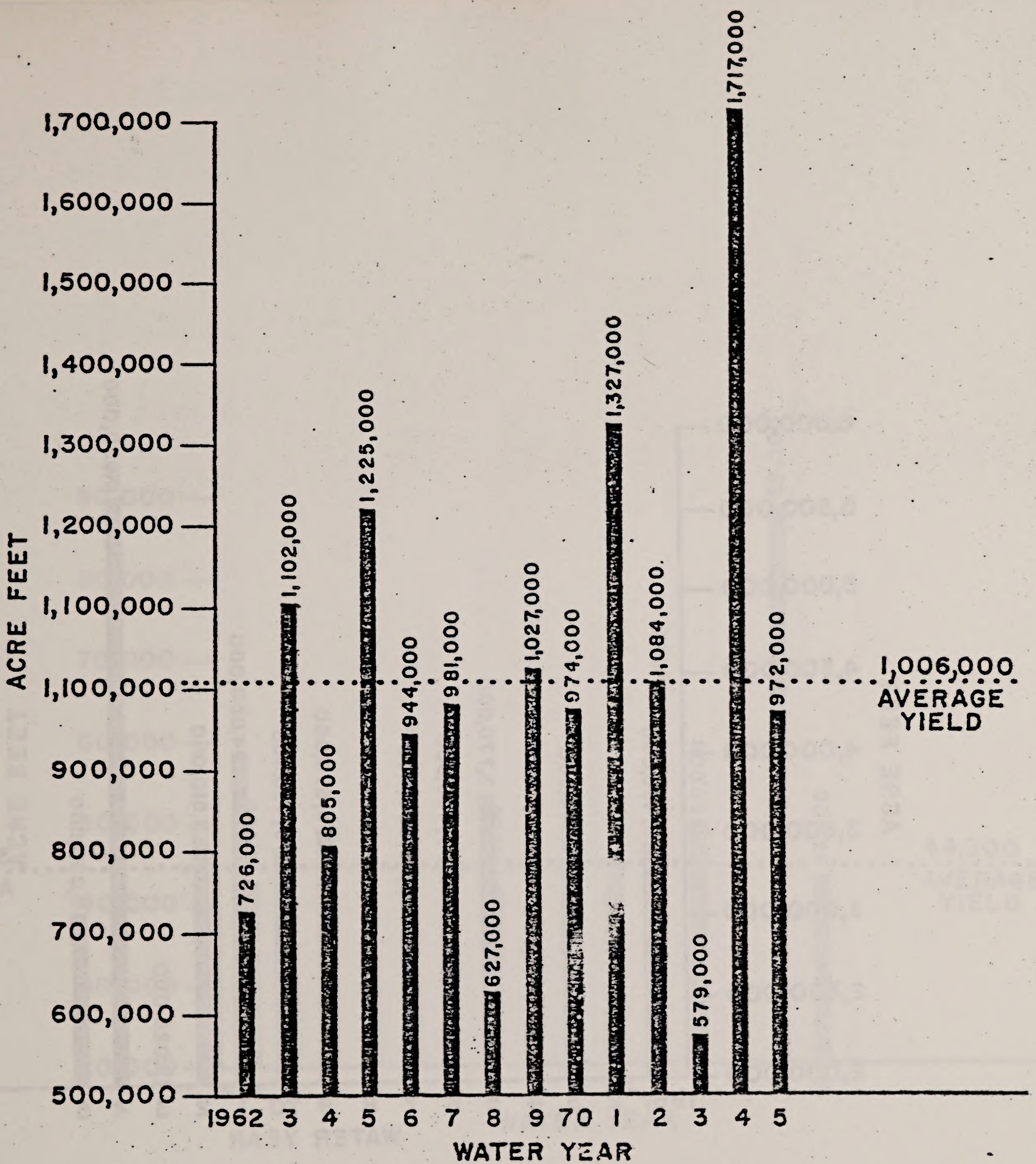


Figure 2.1.1-24 ANNUAL YIELD FOR ILLINOIS RIVER AT KERBY, OREGON 1962-1975

SOURCE: USGS File Data

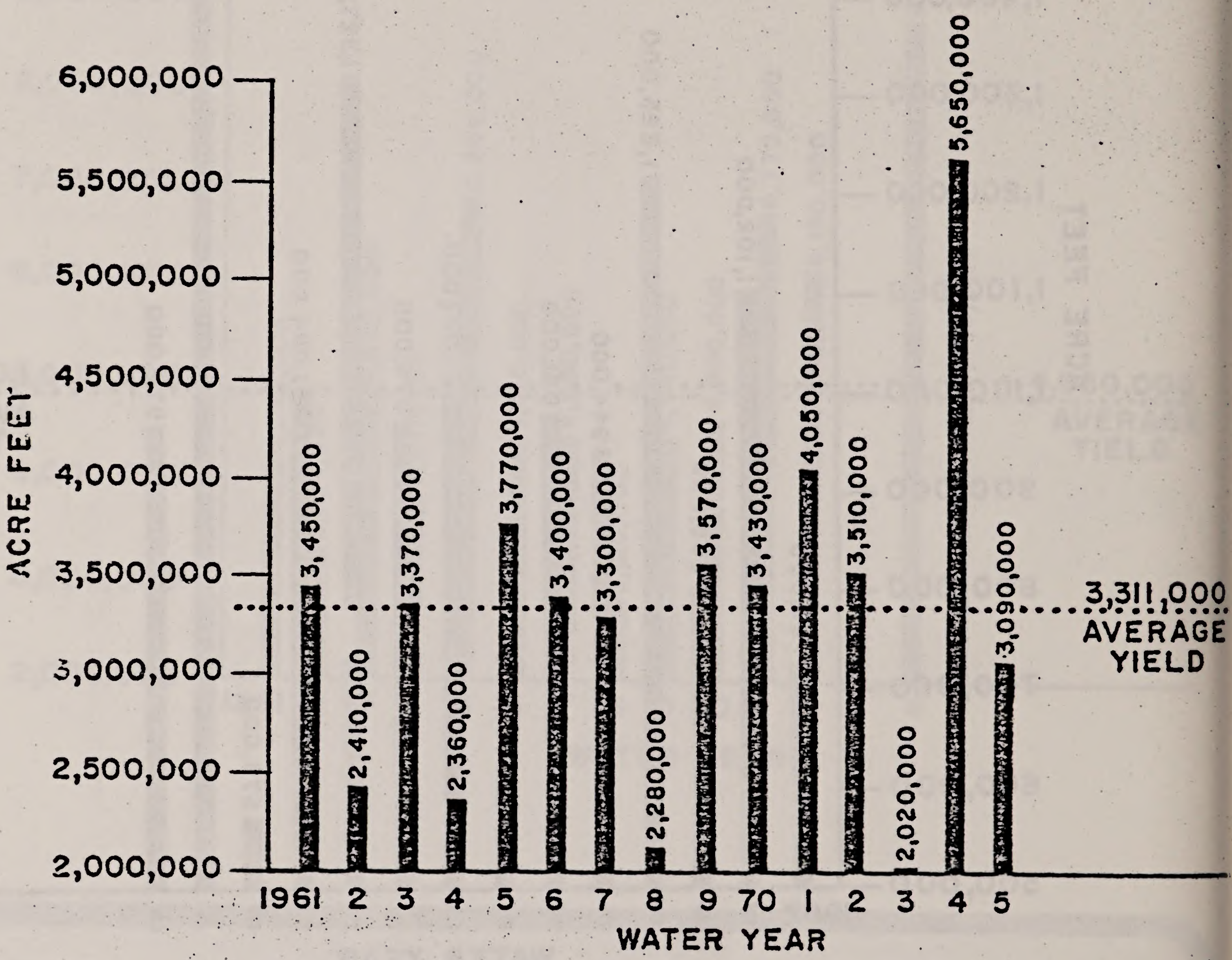


Figure 2.1.1-25 ANNUAL YIELD FOR ILLINOIS RIVER NEAR AGNESS, OREGON 1961•1975
SOURCE: USGS File Data

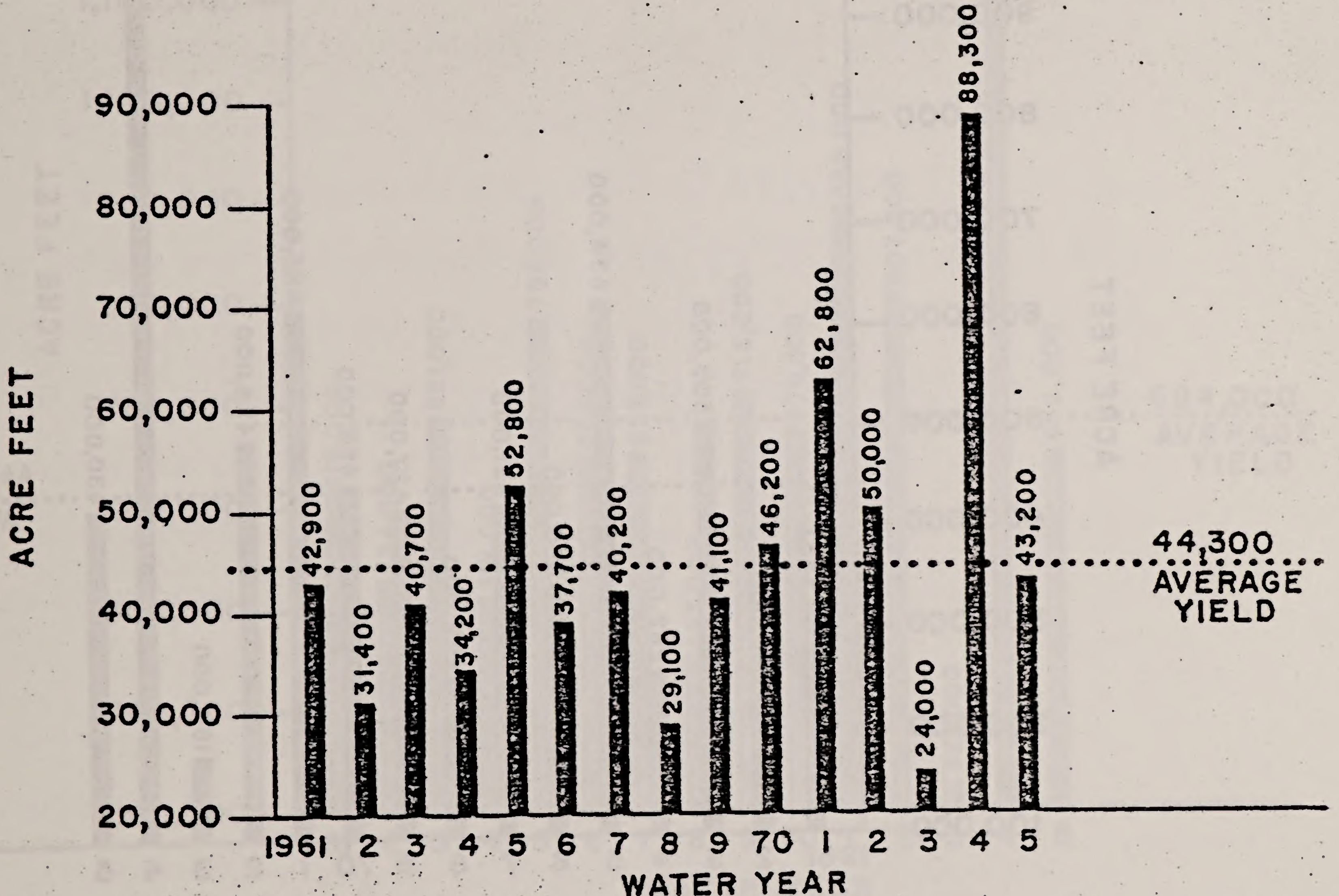


Figure 2.1.1-26 ANNUAL YIELD FOR GRAVE CREEK NEAR PLACER, OREGON 1961 • 1975
SOURCE: USGS File Data

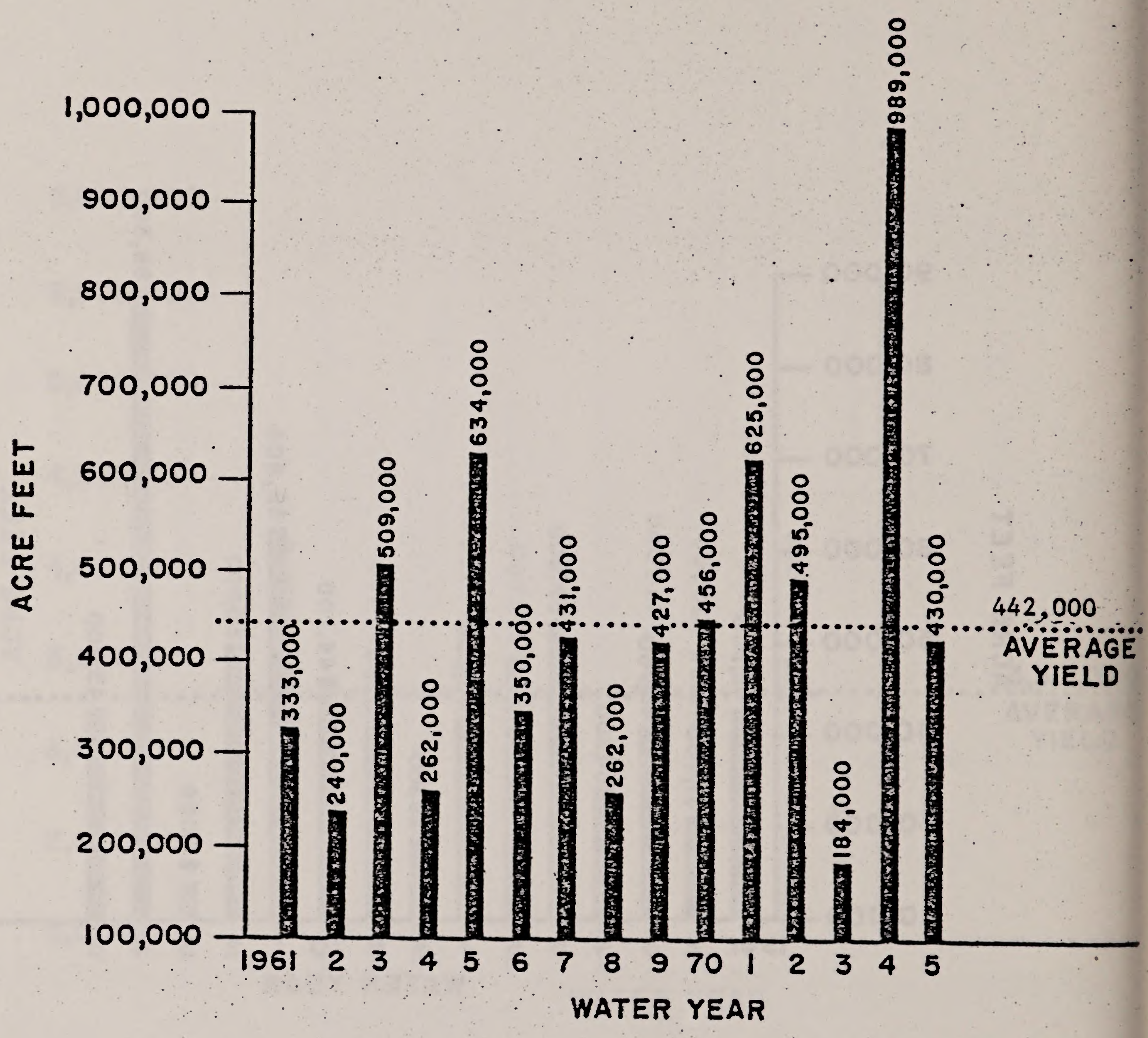


Figure 2.1.1-27 ANNUAL YIELD FOR APPLEGATE RIVER NEAR APPLEGATE, OREGON 1961•1975
SOURCE: USGS File Data

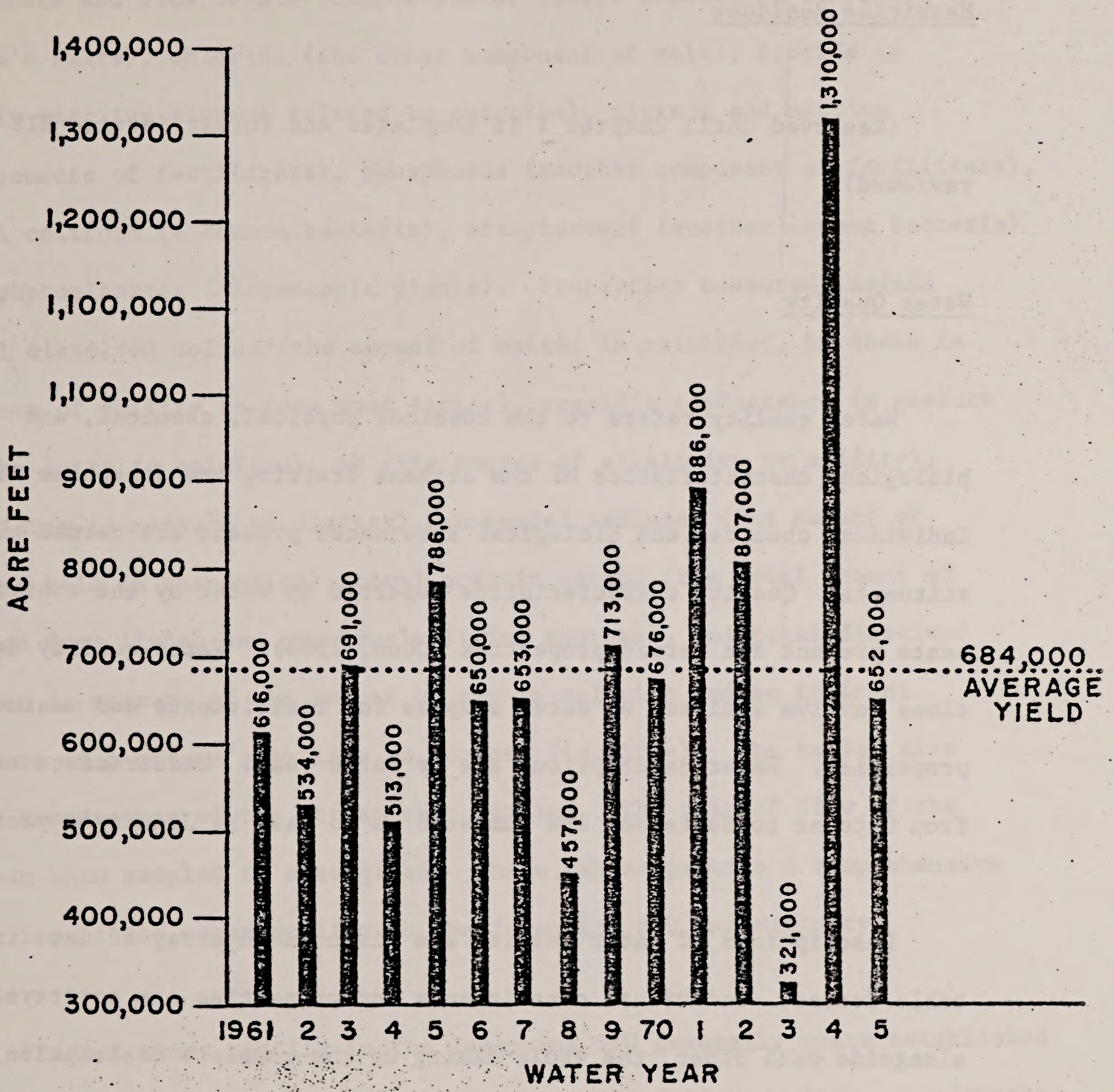


Figure 2.1.1-28 ANNUAL YIELD FOR COW CREEK AT RIDDLE, OREGON 1961 • 1975

SOURCE: USGS File Data

Herbicide Residues

(Reserved until chapter 1 is completed and Forest Service EIS is reviewed)

Water Quality

Water quality refers to the combined physical, chemical, and biological characteristics of the streams draining the Josephine SYU. Individual chemical and biological substances present are termed constituents. Quality characteristics imparted to water by the constituents present are termed properties (Chow, 1964). Water quality descriptions involve analyses of water samples for constituents and measurement properties. Water descriptions are by water year: measurements taken from October to September are numbered as to year by January's year.

Descriptions of water quality are given in an array of data in a table format. Individual constituents and properties are portrayed alongside each other, the whole making up the complete description of the sample. Tables 2.1.1-11 through 2.1.1-14 describe constituents and properties of the Rogue River and the Umpqua River. The tables have been developed from data determined and compiled by the United States Geological Survey from stations at Agness (on the Rogue River) and at Roseburg (on the Umpqua River). Constituents analyzed for include silica (a component of glass), calcium and magnesium (components of lime), sodium (a component of salt), potassium (a somponent of potash),

carbonate and bicarbonate (components of soda), sulfate (a component of Epsom's salts), chloride (the other component of salt), floride (a highly reactive element related to chloride), nitrate and nitrite (components of fertilizers), phosphorus (another component of fertilizers), fecal coliform (a common bacteria), streptococci (another common bacteria) and phytoplankton (microscopic plants). Properties measured include total dissolved solids (the amount of matter in solution), hardness (a measure of ability to form soap lather), specific conductance (a measure of the salts in solution), pH (the degree of alkalinity or acidity), turbidity (a measure of clarity), suspended sediment (the amount of matter held in suspension), total organic carbon (the total amount of carbon from living and previously living sources), and total dissolved oxygen (a measure of the amount of air in solution and an indirect measure of a stream's ability to support fish life). The tables also list temperature of the stream when sampled. The rate of flow of the stream when sampled is also given. These tables provide a comprehensive overview of the water quality in the Josephine SYU and vicinity.

Present water quality in the Josephine SYU generally meets established water quality standards (DEQ, 1976). Table 2.1.1-14 describes constituents and properties of streams inside the boundaries of the Josephine SYU. This data was sifted from agencies conducting water quality monitoring in the SYU vicinity. Figure 2.1.1-28 illustrates the locations of major perennial streams inside the boundaries of the SYU.

A summary of water quality criteria for the State of Oregon is offered in Appendix IV. This table represents Oregon's "non-degradation

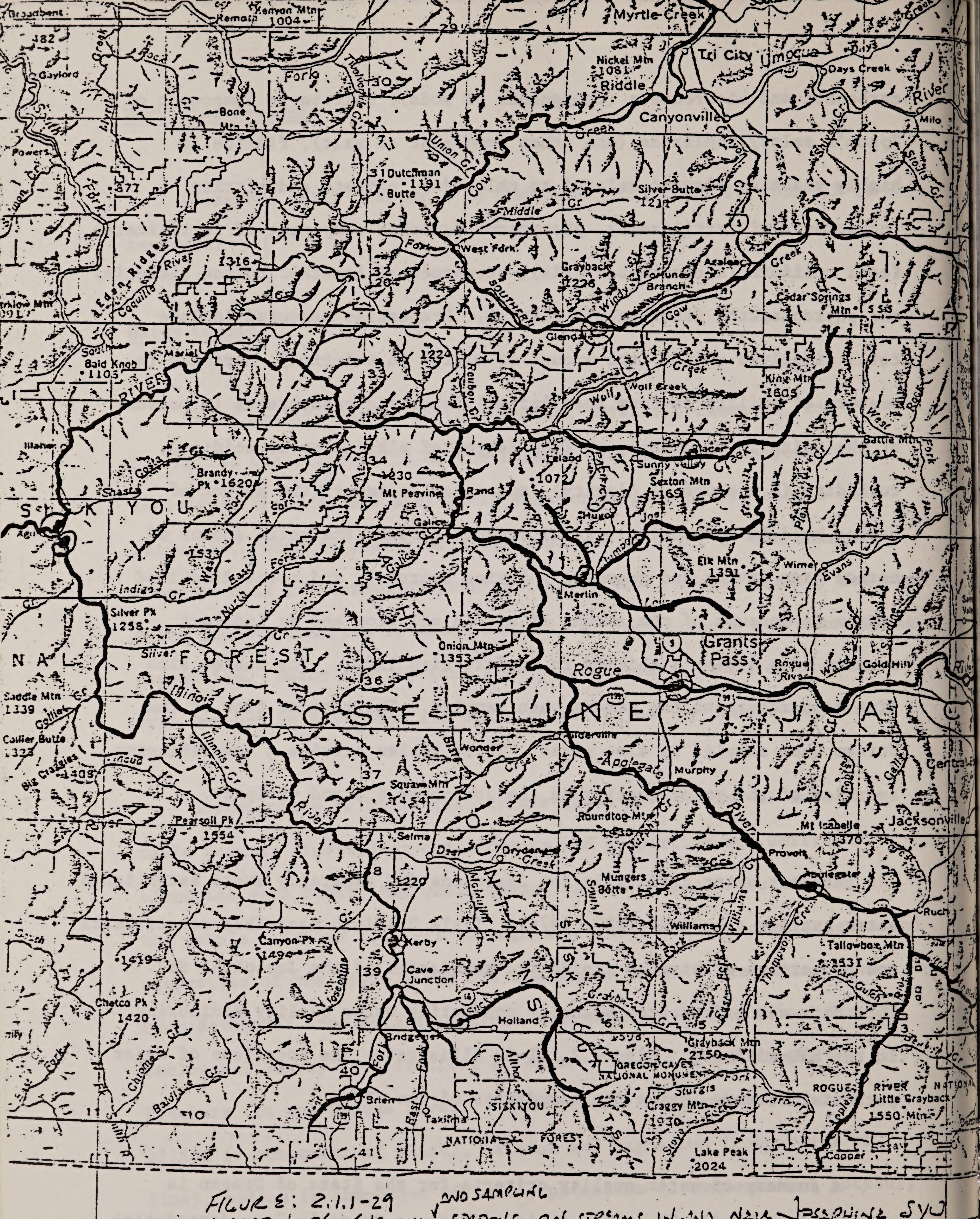


FIGURE: 2.1.1-29
LOCATION OF GAUGING AND SAMPLING STATIONS ON STREAMS IN AND NEAR JOSEPHINE SYU

No adjacent map

Table 2.1.1-10
Chemical Quality of Rogue River near Agness, Oregon for Water Year October, 1974 to September 1975

Date	Instantaneous Discharge ft^3/sec (flow rate)	SiO_2 (mg/l) (silica)	Ca++ (mg/l) (calcium)	Mg++ (mg/l) (magnesium)	Na+ (mg/l) (sodium)	K+ (mg/l) (Potasium)	HCO_3^- (mg/l) (bicarbonate)	$CO_3^=$ (mg/l) (carbonate)	$SO_4^=$ (mg/l) (sulfate)	Cl^- (mg/l) (chloride)	F^- (mg/l) (fluoride)	Nitrate & Nitrite (mg/l)	Total N (mg/l)	Total P (mg/l)	Total Dissolved Solids (residue) (mg/l)	Total Dissolved Solids (sum) (mg/l)	Total Dissolved Solids (tons/day)	Total Dissolved Solids (tons/acre foot)	Ca+Mg Hardness (Mg/l)
10/22	1400	29	11	3.1	5.2	1.5	59	--	3.1	3.1	0.1	--	--	0.08	--	86	325	0.12	40
11/18	2090	25	11	4.3	5.5	1.6	62	--	4.5	5.8	0.0	0.06	0.65	0.09	102	88	576	0.14	45
12/19	4400	23	9..	3.8	4.9	0.9	51	--	3.2	3.1	0.0	0.12	0.27	0.13	83	74	986	0.11	40
1/28	7400	21	9.7	3.7	2.2	1.1	46	--	2.9	3.4	0.1	0.13	0.31	0.07	83	67	1660	0.11	39
2/19	15900	15	8.6	4.0	3.9	0.8	44	--	2.8	1.9	0.0	0.15	4.2	0.16	59	59	2530	0.08	38
3/19	90900	14	8.8	3.3	15	1.3	42	0	4.0	5.7	0.3	0.02	1.4	1.1	118	73	29000	0.16	36
4/23	7680	20	12	3.7	4.4	1.1	56	0	2.5	1.8	0.1	0.08	0.14	0.06	67	74	1390	0.09	45
5/22	7850	18	7.4	2.9	7.9	0.9	43	0	2.4	1.5	0.1	0.04	0.06	0.05	55	62	1170	0.07	30
6/18	5380	19	8.1	2.3	3.5	0.9	38	0	3.0	0.8	0.0	0.01	0.68	0.05	57	56	828	0.08	30
7/23	1910	25	9.5	3.4	4.9	1.3	49	0	4.8	1.8	0.1	0.01	0.17	0.08	74	75	382	0.10	38
8/20	2020	26	9.6	3.3	5.6	1.4	55	0	2.3	2.3	0.1	0.10	0.26	0.13	75	78	409	0.10	38
9/24	1550	26	11	0.8	6.4	1.5	56	0	2.3	2.5	0.1	0.03	0.54	0.10	76	78	318	0.10	31

N = nitrogen
P = phosphorous

(Source: USGS, 1976)

Table. 2.1.1-11
Water Quality Data For Rogue River near Agness, Oregon Water Year 10-74 to 9-75

Date	Specific Conductance (micro-mhos)	pH	Turbidity (JTU)	Suspended Sediment (mg/l)	Suspended Sediment Tons/day	Temperature °C	Temperature °F	Fecal Coliform Col/100ml	Streptococci Colonies per 100 ml	Total Organic Carbon (mg/l)	Phytoplankton cells/ml
10/22	122	7.5	---	4	15	11.5	52.7	8	--	--	--
11/18	119	7.2	1	38	214	9.0	48.2	70	48	--	1400
12/19	111	7.1	7	9	107	7.0	44.6	--	22	--	890
1/28	105	6.6	10	22	440	4.5	40.1	40	20	2.8	340
2/19	90	7.2	60	31	1330	5.5	41.9	42	1.75	--	120
3/19	160	7.1	400	2600	638000	6.0	42.8	1160	1400	--	650
4/23	173	7.3	5	22	456	10.5	50.9	4	10	5.7	1100
5/22	99	7.3	7	67	1420	12.5	54.5	13	7	--	530
6/18	69	7.3	3	30	436	16.0	60.8	14	22	--	1500
7/23	93	7.5	2	8	41	22.0	71.6	4	2	3.2	3700
8/20	99	7.4	3	12	65	18.0	64.4	8	100	--	3200
9/24	112	7.7	1	6	25	17.5	63.5	3	4	--	1900

(Source: USGS, 1976)

Table 2.1.1-12
Chemical Quality of Umpqua River near Roseburg, Oregon for Water Year October 1974 to September 1975

Date	Instantaneous Discharge ft^3/sec (flow rate)	SiO_2 (mg/l) (Silica)	Ca^{++} (mg/l) (calcium)	Mg^{++} (mg/l) (magnesium)	Na^+ (mg/l) (sodium)	K^+ (mg/l) (Potassium)	HCO_3^- (mg/l) (bicarbonate)	$CO_3^=$ (mg/l) (carbonate)	$SO_4^=$ (mg/l) (sulfate)	Cl^- (mg/l) (chloride)	F^- (mg/l) (fluoride)	Nitrate & Nitrite (mg/l)	Total N (mg/l)	Total P (mg/l)	Total Dissolved Solids (residue) (mg/l)	(sum) (mg/l)	(tons/day)	(tons/acre foot)	Ca+Mg Hardness (mg/l)
10/23	80	--	21	11	--	--	89	--	--	--	--	1.3	1.8	0.52	151	--	32.6	0.21	98
11/19	2400	--	17	3.9	--	--	73	--	--	--	--	0.22	1.0	0.21	130	--	778	0.16	59
12/20	7000	--	11	3.0	--	--	40	--	--	--	--	0.12	0.26	0.08	109	--	2060	0.15	40
1/29	4300	17	10	3.1	3.7	1.0	40	--	3.3	2.5	0.0	0.23	0.34	0.04	75	62	871	0.10	38
2/20	28000	12	6.1	2.8	6.4	0.9	31	--	2.9	3.1	0.0	0.06	0.53	0.22	--	50	3780	0.07	27
3/18	12200	--	7.8	3.7	--	--	44	0	--	--	--	0.05	0.31	0.12	76	--	2500	0.10	35
4/22	3270	--	9.0	3.6	--	--	45	0	--	--	--	2.3	2.3	0.05	62	--	547	0.08	37
5/21	2320	--	40	2.8	--	--	37	0	--	--	--	0.02	0.12	0.03	53	--	332	0.07	110
6/17	820	--	8.8	2.9	--	--	36	0	--	--	--	0.00	1.1	0.06	58	--	128	0.08	34
7/22	570	--	15	5.2	--	--	56	0	--	--	--	0.07	0.50	0.17	88	--	135	0.12	59
8/19	383	--	15	6.7	--	--	70	0	--	--	--	0.19	0.84	0.30	99	--	102	0.13	65
9/23	244	9.3	15	6.7	11	1.5	69	0	8.4	13	0.1	0.20	0.90	0.38	100	--	65.9	0.14	65

N = nitrogen
P + phosphorous

(Source: USGS, 1976)

Table 2.1.1-13

Water Quality Data For Umpqua River near Roseburg, Oregon - Water year 1975

Date	Specific Conductance (Micro-mhos)	pH	Turbidity (JTU)	Temperature °C	°F	Fecal Coliform col/100ml	Streptococci Colonies per/100ml	Dissolved Oxygen (mg/l)
10/23	225	7.3	7	13.0	55.4	1660	72	6.9
11/19	195	7.1	10	10.0	50.0	58200	1020	11.3
12/20	92	7.0	30	8.5	47.3	150	35	10.9
1/29	90	6.7	15	4.5	40.1	40	1	13.2
2/20	75	7.2	20	7.0	44.6	320	100	12.0
3/18	88	7.2	85	8.5	47.3	3100	2820	11.2
4/22	93	7.2	6	11.0	51.8	20	5	11.3
5/21	70	7.3	3	13.5	56.3	20	27	9.7
6/17	81	7.3	2	19.0	66.2	54	18	9.4
7/22	130	7.8	1	25.5	77.9	120	5	8.4
8/19	165	7.6	2	21.0	69.8	3060	80	7.8
9/23	185	7.7	2	20.0	68.0	2080	6	-

(Source: USGS, 1976)

Table 2.1.1-.14

Summary of Water Quality of Major Perennial Streams in Josephine SYU by Source

State of Oregon, Department of Environmental Quality, February 1976

Name of Stream Location of Station	Temperature °C-°F °C-°F Jun - Oct Nov - May		Dissolved Oxygen mg/l Jun - Oct Nov - May	Dissolved Oxygen % Saturation Jun - Oct Nov - May	Turbidity JTU Jun - Oct Nov - May	Total Dissolved Solids Jun - Oct Nov - May	Chloride Jan - Dec	Mph Tc/100ml Jun - Oct Nov - May	Flow Ft^3/sec Jun - Oct Nov - May
Rogue River	10-50	25-77	8.1 - 12.0	87 - 135	1 - 15	46 - 90	0.5 - 4.3	45 - 24,000	750 - 4750
at Grants Pass	2-36	12-54	10.7 - 13.5	93 - 111	- 1	65		230 - 24,000	1417 - 8290
Rogue River	10-50	25-77	7.8 - 11.5	83 - 124	2 - 17	64 -106	0.8 - 4.3	230 - 7,000	-- --
2.5 mi. west of Grants Pass	3-37	13-55	11.0 - 13.1	97 - 112	- 1	64		600 - 7,000	-- --
Rogue River	11-52	26-79	7.9 - 12.0	87 - 135	0 - 25	36 -136	0.5 - 9.8	45 - 7,000	-- --
at Robertson Bridge	4-39	14-57	10.8 - 13.0	97 - 114	0 - 33	53 -174		230 - 7,000	-- --
Rogue River	14-57	22-72	8.0 - 10.3	89 - 108	1 - 15	39 - 98	0.5 - 4.9	45 - 700	-- --
below Grave Creek--	11-52		11.6	107	4	25		7,000 --	--
Applegate River	10-50	26-79	8.1 - 12.4	84 - 147	0 - 48	30 -159	0.5 -46.2	45 - 2,400	11 - 716
at Applegate	4-39	13-55	9.8 - 12.8	98 - 107	1 - 16	69 -179		45 - 7,000	77 - 1150
Applegate River	12	28	7.5 - 12.3	78 - 138	0 - 20	43 -140	0.2 - 9.7	45 - 2,400	-- --
at Wilderville	5	14	10.4 - 12.4	92 - 108	1 - 42	45 - 99		60 - 7,000	-- --
Cow Creek	14	26	7.5 - 10.3	89 - 115	1 - 15	84 -129	0.2 -18	60 - 7,000	-- --
at Glendale	5	16	9.6 - 12.0	91 - 100	2 - 65	64 -109		000 - 2,400	-- --

Table 2.1.1.- 14 continued

U.S. Environmental Protection Agency, Storet Data (Computer Retrieval Service for Water Quality), Data for Josephine SYU as of 5-2-77
(All numbers given are mean values for all samples taken over a three year period from January 1973 to August 1976)

Name of Stream Location of Station	Temperature °C	°F	Turbidity JTU	Conductivity Micromhos @ 25°C	Dissolved mg/l	% Sat	Bod mg/l	pH	Total N mg/l	Total P mg/l	Total Org. C mg/l	Chloride mg/l	Sulfate mg/l	Total Caliform MPN Conf/100ml
W. Fork Illinois River at Hwy 199 Bridge	-	-	-	-	-	-	-	-	-	-	4.7	-	-	-
Sucker Creek at Takilma Rd. Bridge	13	55	2.8	95	9.7	94.8	0.35	7.2	0.5	0.2	3.5	1.7	1.9	489.2
Louse Creek at Pleasant Vally Rd. Br.	18.6	65.5	4.0	110	7.9	98.0	0.7	7.5	-	-	-	-	-	450
Quartz Creek at Mouth	13.3	55.9	3.0	95	9.4	98.0	0.5	7.2	-	-	-	-	-	450
Jumpoff Joe Creek At Russel Rd. Br.	17,3	63.1	-	120	9.2	100	0.5	7.6	-	-	-	-	-	450

See Figure 2.1.1-28 for locations of sampling stations

clause" with respect to waters of the State. All states are required by Public Law 92-500 - The Federal Water Pollution Control Amendments of 1972 - to prepare and implement Water Quality Management Plans for all drawable basins. Oregon law - ORS Chapter 408 - directs the compilation and implementation of Water Quality Management Plans. The table represents the standards to which waters in the Rogue and Umpqua River Basins must be kept (DEQ, 1976).

Fire

Fire in the Ecosystem

Coniferous forests in North America, including those of the Josephine SYU, were probably always fire-dependent ecosystems. Fires controlled the age structure and species composition of the trees. These factors, in turn, affected the types of ecological niches available to animals and probably contributed in large part to the evolution of characteristic animal populations within the coniferous forest biome.

Pristine forests are not homogeneous stands of old-growth or climax forests but are instead a mosaic of successional stages initiated by fire or other natural causes. Stages range from bare earth through climax stands. Most old growth stands probably contain overstory tree species which germinated as a result of a major fire hundreds of years previously. Douglas-fir, the principle commercial species of the SYU, is ecologically sub-climax in most cases. True climax stands were probably uncommon, occurring primarily on sites where fires were rare.

Fire is an integral part of the environment. It creates natural openings in dense forests. These openings harbor many wildlife forage plants that cannot exist in old growth, closed canopy forests. Two of the most important game animals in the SYU, black-tailed deer and Roosevelt elk, are greatly dependent on forest openings. Climax forests cannot provide sufficient forage to maintain sizable populations of these herbivores.

Fire facilitates reproduction in many plant species by reducing vegetation competition, releasing mineral nutrients in the soil, and stimulating sprouting or seeding in certain species such as lodgepole pine, some birches and oaks (Heinselman, 1971).

Fire may also serve as a major force in reducing populations of forest insects and parasites. For example, dwarf-mistletoe is temporarily eliminated when fire destroys its host species, because, although the host trees may reproduce easily after fire, mistletoe does not (Heinselman, 1971). Fires may temporarily eliminate localized outbreaks of forest insects. On the other hand, wild fire in some cases may weaken trees, making them more susceptible to insect or disease attack.

As the foregoing discussion illustrates, the entire forest ecosystem has apparently evolved within the constraints provided by periodic wildfires. Modern civilization demands the production of enormous amounts of timber, however, and wildfires destroy much timber that could be utilized by man. For this reason it is economically desirable to

protect the forest from natural wildfires and use prescribed burns in ways that promote economically valuable tree species.

Fire Occurrences Within the SYU

While there is extreme variation from year to year, the overall predominant cause of fire is lightning. Man-caused fires ranging from arson to carelessness and including automobile accidents and plane crashes result in resource damage on considerably more acres, however. Table 2.1.1-15 shows fire occurrence in the SYU since 1966.

Over the period analyzed, 173 lightning strikes burned 141 acres. Although one fire (Quail Creek in 1970) of 2269 public land acres skew the data, man's actions in the same time period caused resource damage to 3268 acres from only 65 fire occurrences.

The fire season in the SYU generally begins in May and often lasts until the middle of October. Weather patterns during this time of year are generally conducive to forest fires due to the hot, dry summer and numerous isolated thunderstorms. It is also the season of increased recreational usage of the forest.

Fire Protection

In western Oregon, BLM contracts all fire presuppression and fire fighting operations to organizations equipped to handle the action.

TABLE 2.1.1-15

Fire Occurrence
in the Josephine Sustained Yield Unit

Year	Lightning Caused		Man Caused	
	Number	Acres 1/ NRL	Number	Acres 1/ NRL
1966	25	25	5	197
1967	--	--	2	68
1968	4	2	6	71
1969	15	35	7	21
1970	6	4	7	2481
1971	2	1	2	4
1972	15	6	3	2
1973	27	21	11	346
1974	29	20	13	10
1975	43	25	7	64
1976	7	2	2	4
	173	141	65	3268

1/ Estimates rounded; class A fires figured at 0.25 acres each.
Source: BLM Fire Reports on file Oregon State Office.

Within JSYU, Oregon State Board of Forestry, through several of its subordinate units and associations, is the primary contractor. Following predetermined division of responsibility between OSBF and the Forest Service, a small portion of JSYU protection is contracted to USFS.

All contracts are structured on a flat-rate per acre basis, taking into consideration cost of the previous year's operations. Heavy fire cost in a particular year brings an "actual cost" clause into effect.

Where special or extra protection is desired, the fire plan and contracts provide for this. Within the SYU 125,000 acres adjacent to the Rogue Wild and Scenic River have been covered by special protection provisions since 1970.

Biological Environment

Living organisms of the Josephine SYU are discussed in the following subsections. The introductory subsection on ecologic setting emphasizes the inherent interaction between plants and animals by providing a general framework discussion of natural community functions within the SYU.

The plant communities of the SYU are thoroughly described in Subsection 2.1.2.2 without reference to animals. Animals, however, as previously mentioned, are intimately associated with vegetation and are difficult to describe without reference to it. For this reason, Subsection 2.1.2.3 presents a general tabulation of vertebrate fauna within the context of natural biotic communities. The fauna are then more thoroughly discussed by animal group.

Common names are used, where possible, for all plants and animals discussed throughout the section. A complete list of common and scientific names for all organisms discussed in the section is presented in the appendices. In some cases, such as several of the endangered plants, no common names exist and, therefore, scientific names must be used in the text.

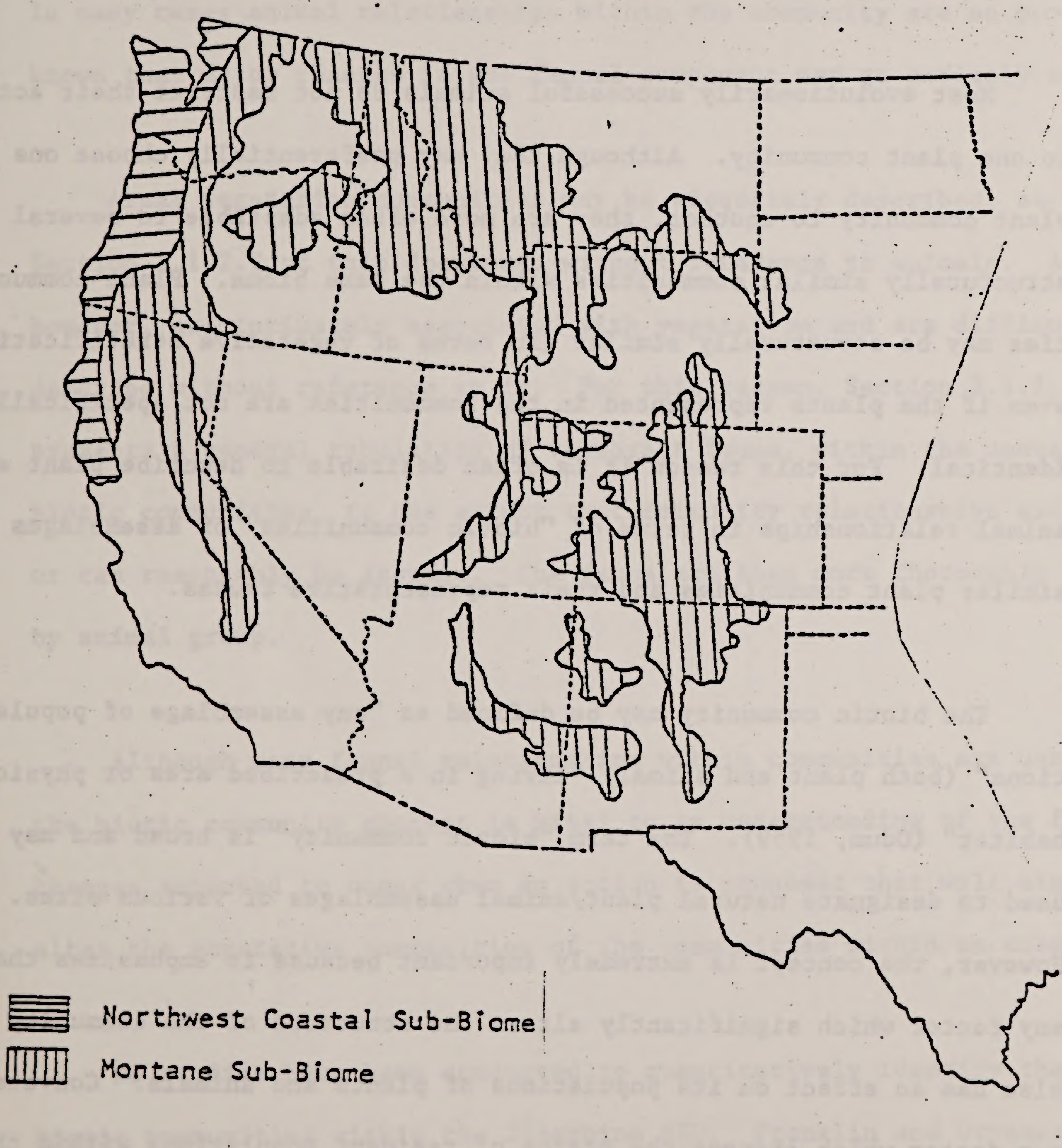
Ecologic Setting

The Josephine Sustained Yield Unit lies within the Coniferous Forest Biome. More specifically it lies within a transition zone between the Northwest Coastal and the Montane sub-biomes (See Figure 2.1.2-1).

Biomes are large geographic units, the largest recognizable ecologic units, which are differentiated on the basis of climax vegetation. Vegetation, which furnishes habitat for animals, is determined by physical factors (fire, weather, soil, parent material, etc.) and biological factors (soil organisms, herbivorous animals, etc.). All components of the biome interact and shape its characteristics. Although the biome is named on the basis of climatic climax vegetation the unit may also include climax vegetation communities which develop in response to localized conditions and all successional stages preceding the climax.

Within each biome are numerous plant communities which reflect local differences in site suitability for plant species with different environmental tolerances. Intra-biome plant communities may also differ from the climatic climax because of local disturbances such as logging or fire, which may preclude or retard the development of the climatic climax.

FIGURE 2.1.2-1. Extent of the Coniferous Forest Biome in the Conterminous United States



Faunal representation differs with intra-biome differences in plant life-forms. Therefore it is not probable that any specific site will contain the full complement of animal species that occur within an entire biome. A few species, however, have wide environmental tolerances and can be expected to occur in most areas within the biome. There is also a certain amount of "faunal overlap" between biomes.

Most evolutionarily successful animals do not restrict their activiti to one plant community. Although they may preferentially choose one plant community to another, they are more often adaptable to several structurally similar communities within the same biome. Plant communities may be structurally similar (in terms of vegetative stratification) even if the plants represented in the communities are not specifically identical. For this reason it is often desirable to describe plant and animal relationships in terms of "biotic communities" or assemblages of similar plant communities and their representative faunas.

The biotic community may be defined as "any assemblage of populations" (both plant and animal) "living in a prescribed area or physical habitat" (Odum, 1959). The term "biotic community" is broad and may be used to designate natural plant/animal assemblages of various sizes. However, the concept is extremely important because it emphasizes that any factor which significantly alters the structure of the community also has an effect on its populations of plants and animals. Conversely, any factor which changes the status of resident populations within the

will ultimately change the community unit. Obviously, changes involving dominant species will be the most dramatically expressed.

The effects of changes in dominant plants may be readily evident on other plant components of the community but less obvious and non-quantifiable on animal components. Animals may simply emigrate whereas plants cannot. In many cases animal relationships within the community are so poorly known that major changes in the faunal component may go entirely unnoticed.

Areal vegetation communities may be adequately described, as in Section 2.1.2.2 of this document, without reference to animals. Animals, however, are intimately associated with vegetation and are difficult to describe without reference to it. For this reason, Section 2.1.2.3 presents a general tabulation of vetebrate fauna, within the context of biotic communities, to the extent that community relationships are known or can reasonably be assumed. The fauna are then more thoroughly discussed by animal group.

Although many faunal relationships within communities are unknown, the biotic community concept is vital to an understanding of the faunal changes expected to occur when an action is proposed that will significantly alter the vegetative composition of the communities within an area.

No studies have been conducted to quantitatively identify the biotic communities within the Josephine SYU. Franklin and Dryness (1973) provided an excellent description of vegetational zones which can

Table 2.1.2-1

Biotic Communities of the Josephine SYU and Their Approximate Equivalence to Plant and Animal Life Zones or Communities Described by Various Authors.

Authority	Community or Life Zone	Biotic Community Equivalent
Franklin & Dyrness (1973)	Interior Valleys Vegetation Zone	
Bailey (1936)	Semi-arid Upper Sonoran Life Zone	Chaparral-oak
Browning (1975)	Chaparral-oak community	
Franklin & Dyrness (1973)	Mixed-Evergreen Vegetation Zone	
	Mixed-Conifer Vegetation Zone	
Bailey (1936)	Humid and semi-humid Transition zone	Mixed conifer
Browning (1975)	Mixed conifer community	
Franklin & Dyrness (1973)	White fir Vegetation zone	
	Shasta red fir Vegetation Zone	True fir
Bailey (1936)	Canadian Life zone	
Browning (1975)	True fir community	

be directly applied to the area. Browning (1975) described the avian communities of Jackson County, and Bailey (1936) described the mammals of Oregon based on a life zone concept which can be applied to the sustained yield unit. If information from these sources is combined with information in the Unit Resource Analysis for the Glendale, Galice and Grants Pass Resource Areas, it is possible to subjectively assign the terrestrial vertebrates of the Josephine SYU to three major biotic communities. The biotic communities used and their approximate equivalence to plant and animal communities or life zones described by other authors are shown in Table 2.1.2-1.

Terrestrial Vegetation

Terrestrial vegetation is described in terms of "zones" adapted from those identified by Dyrness & Franklin (USDA, 1973) in their Natural Vegetation of Oregon and Washington. Unless otherwise noted, all terrestrial vegetation data are drawn from that source. Scientific names of all plants species mentioned in this statement are listed in Appendix II.

Zones within the JSYU are as follows. Refer to the previous section for a discussion of allocation of vegetative zones to biotic communities.

1) Interior Valleys Zone (pines, oaks and Douglas-fir)

2) Douglas-fir/Hardwoods Zone (Douglas-fir, evergreen hardwood).

3) Mixed Conifers Zone (Douglas-fir, pines, incense-cedar and true firs).

4) White Fir Zone (white fir).

The arrangement of these zones in the eastern and western Siskiyou Mountains of the JSYU is shown in Figure 2.1.2-2. The acreage distribution of these zones by land jurisdiction is given in Table 2.1.2-2. Waring (1969) has identified the floristic boundary between the eastern and western Siskiyous as far north as the Rogue River. Lacking botanical studies to fix the boundary north from the Rogue River, a probable boundary has been projected based on climate, geology, and observed vegetation patterns.

Within each vegetation zone forest stratification, i.e. layering, creates numerous vegetation communities. Primary variable in this relationship is availability of light and other plant growth characteristic are secondary (Figure 2.1.2-3).

Interior Valleys Zone

This zone refers to the lowlands and valley bottoms enclosed by the Siskiyou (Klamath) Mountains. Approximately 245,000 acres in the SYU is within this zone. Although scattered conifer forests occur here, only about 6.8 per cent of the public lands within the zone is considered commercial forest land (Table 2.1.2-2). Plant communities include

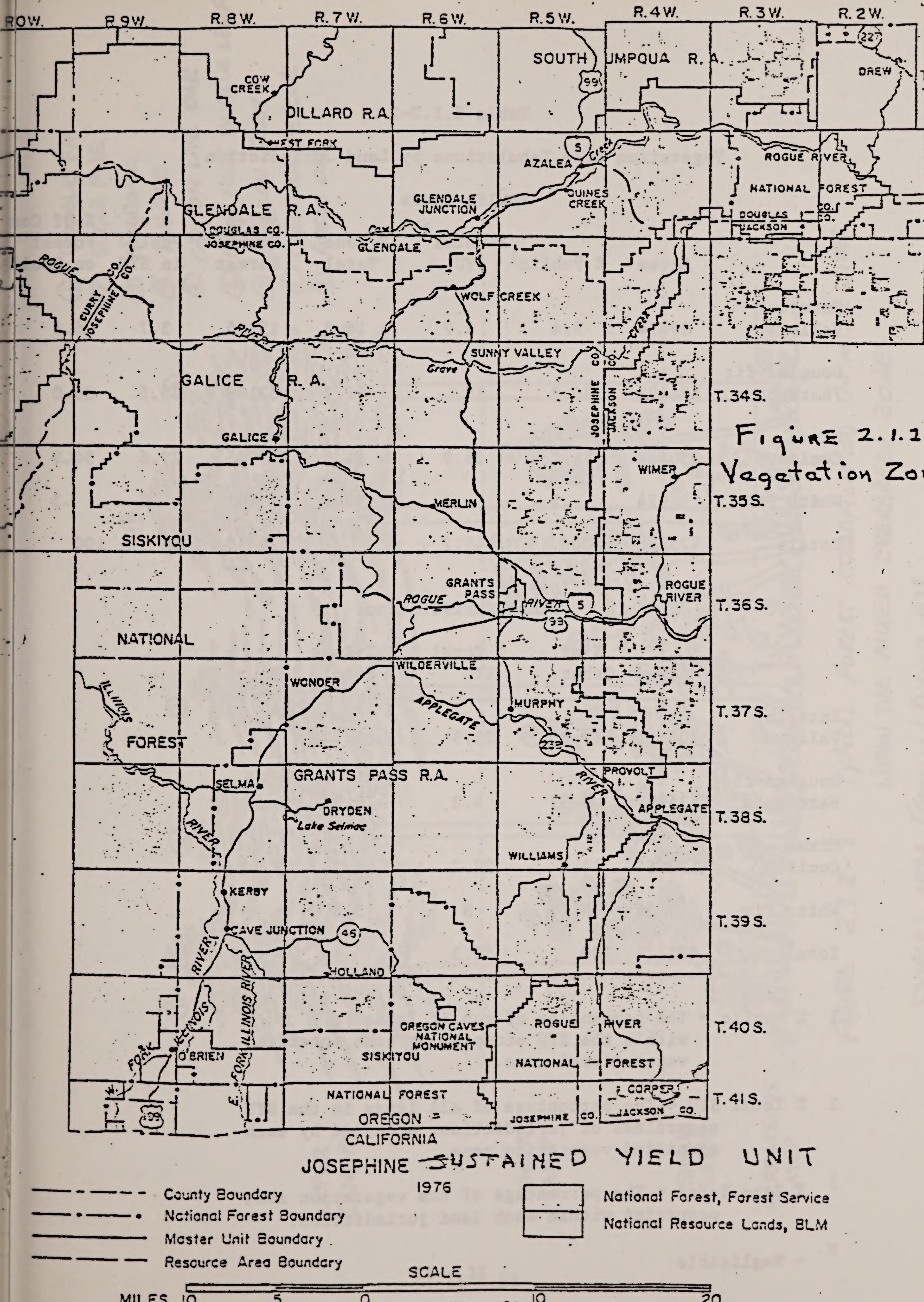


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Figure 2.1.1-2
Vegetation Zones

Table 2.1.2-2

Vegetation Zone Tabulations by Land Jurisdiction

Public Lands

	Acres	% Public[1]	% Total[2] SYU	% Zone[3] Total	Acres Comm'l Forest	% of Public in SYU	% of Comm Forest on Public
Interior Valleys	39814	9.4	4.7	16.3	15595	3.7	6.8
Douglas-fir /hardwoods	154493	36.3	18	81.1	87109	20.5	38.0
Mixed Conifer	230489	54.1	26.9	54.8	125905	29.6	54.9
White Fir	924	.2	.1	96.2	701	.2	.3
Totals	425720	100	49.7		229310	54	100

Other Jurisdictions

	Acres	% of Other	% Total SYU	% Zone Total
Interior Valleys	204655	47.5	23.9	83.7
Douglas-fir/ Hardwoods	35969	8.3	4.2	18.9
Mixed Conifer	190464	44.2	22.2	45.2
White Fir	36	N	N	3.8
Total	431124	100	50.3	

1 % Public = The percentage of public lands within the SYU occupied by each specified vegetational zone.

2 % Total SYU = The percentage of all lands in the SYU regardless of jurisdiction, occupied by each specified vegetation zone.

3 % Zone Total = The percentage of the vegetation zone occurring within each land jurisdiction.

N = Negligible

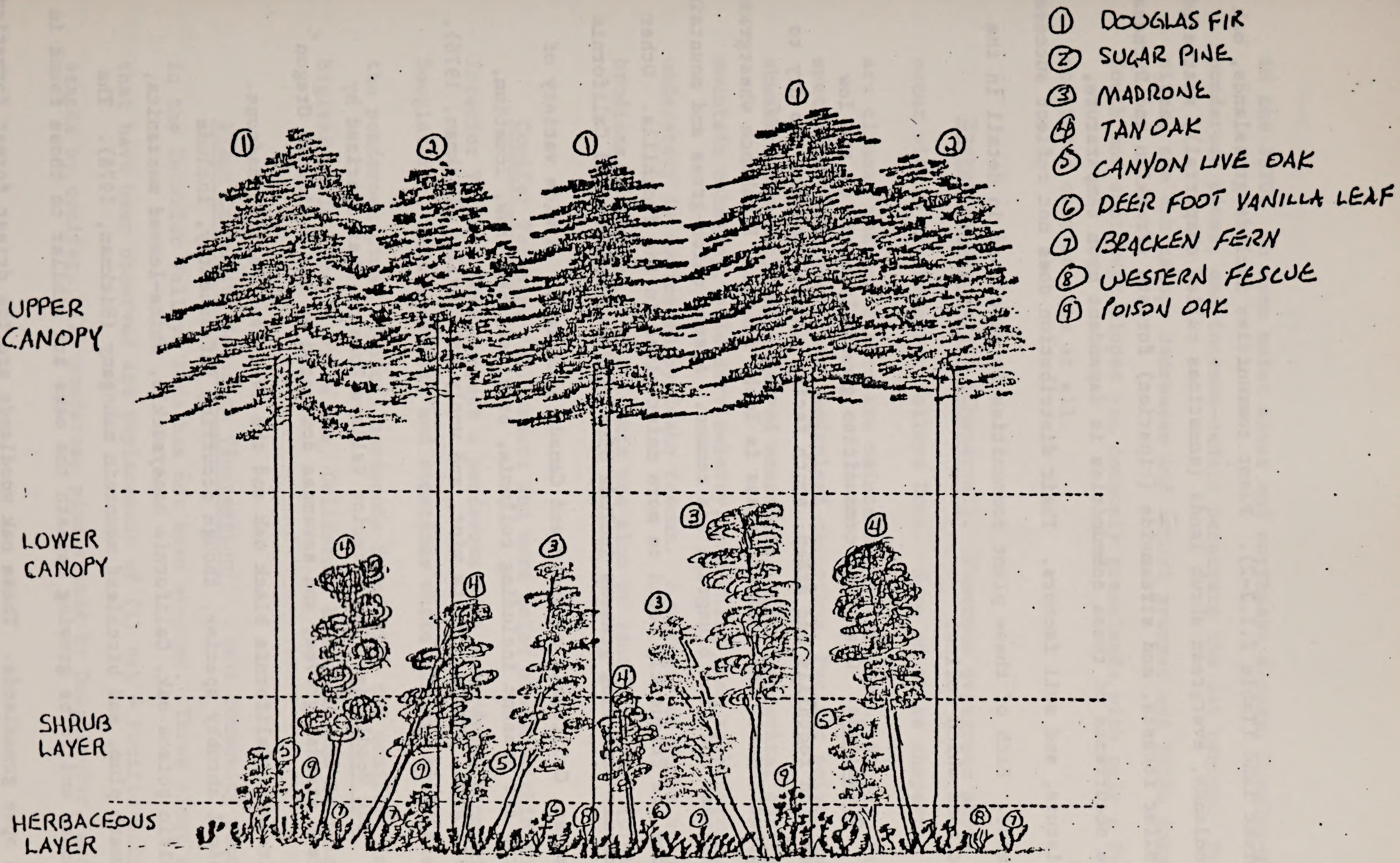

FIGURE 2.1.2-3 TYPICAL FOREST STRATIFICATION ON MESIC SITES WITHIN THE MIXED EVERGREEN ZONE

SOURCE: AFTER FRANKLIN & DYRNESS, 1973

forest land (Table 2.1.2-2). Plant communities include grasslands, oak woodlands, evergreen shrub lands (sometimes called chaparral), scattered conifer forests, and streamside (riparian) forests (Franklin and Dyrness). The occurrence of these communities is dependent upon temperature, moisture, and soil factors. Their distribution does not reflect successional trends. Each of these plant communities is described in detail in the sections which follow.

Grasslands. Grassland communities generally occur on the low elevation foothills and steep, south facing slopes that are too dry to support trees. The dominant grass is Idaho fescue. Bluebunch wheatgrass, Junegrass and pine bluegrass are common. Alaska onion-grass and mountain brome are frequently found on more moist sites in the foothills. Other commonly occurring grasses include blue wildrye, western and California fescues, California oatgrass and Canada bluegrass. A wide variety of forbs are present including collomia, brodiaea, bedstraw, lomatium, dusty pink, yarrow, coyote mint, and wooly eriophyllum (Hickman, 1976).

Oak Woodlands. The Interior Valleys Zone is characterized by forest stands, groves, and savannas dominated by the deciduous Oregon white oak, California black oak and the evergreen Pacific madrone. Typical shrubby species, though occurring infrequently, include Pacific poison oak, California honeysuckle, white-leaved manzanita, Klamath plum, and birchleaf mountain mahogany (Hickman, 1976). The grasses and forbs growing beneath the oaks are similar to those found in the open grasslands. These oak woodlands are the driest forest formations

in the JSYU. On more moist sites and northeast slopes, Douglas-firs, ponderosa pines, and incense-cedars penetrate the oak canopy. On drier sites, the oak canopy decreases and annual grasses and forbs increase. South and southwest slopes are commonly grasslands with only a few scattered oaks or none at all.

Evergreen Shrublands (Chaparral). Numerous evergreen shrub communities occur within the Interior Valleys Zone. Some of these chaparral communities are climax, whereas others are maintained by recurring fires. Predominant species include deerbrush, wedgeleaf ceanothus, Pacific poison oak, skunkbrush sumac, white-leaved manzanita, hoary manzanita, curlleaf mountain mahogany, pale serviceberry, and white stem rabbitbrush. The understory is dominated by Idaho fescue. A variety of forbs such as brodiaea, bedstraw, and collomia are also present (Hickman, 1976).

Conifer Forests. Hillcrests and more moist slopes within the Interior Valleys Zone support a ponderosa pine - hardwood community. Douglas-fir, incense-cedar, and sometimes white fir are associated with the ponderosa pine. Typical hardwoods found with the conifers include bigleaf maple, Oregon white oak, California black oak and Pacific madrone.

Plant Community Sequence (Succession). Plant community succession in the Interior Valleys Zone has not been studied. Three plant successions that have been observed are replacement of (1) oak - Pacific madrone stands by conifers, (2) ponderosa pine stands by Douglas-fir, and (3)

Douglas-fir stands by white fir. In various parts of the Interior Valleys Zone, Douglas-fir, ponderosa pine - oaks, and chaparral may be the potential climatic climax communities.

Forest Zones

The forest vegetation zones described in this section are those zones in the Siskiyou Mountains lying outside of the Interior Valleys Zone.

Douglas-fir/Hardwoods Zone. Approximately 38 per cent of the commercia forest land on public lands within the SYU is located in the Douglas-fir/hardwoods zone. Most sites within the zone are generally occupied by a mixed forest of evergreen needle-leaved trees (upper strata) and evergreen broad-leaved trees (lower strata). This zone grades into the Interior Valleys Zone at its lower elevational limit and into the White Fir Zone at its higher elevational limit. In the eastern Siskiyous, this zone is replaced by the Mixed Conifers Zone.

Forest Composition. The upper canopy is dominated by Douglas-fir, with sugar pine frequently present on ridge tops and south and west-facing slopes. The lower, evergreen broad-leaved (sclerophyll) tree canopy is dominated by tanoak associated with canyon live oak, Pacific madrone, and golden chinquapin. Douglas-fir and tanoak are considered to be the major climax species in this vegetative zone. The shrub layer

averages about 30 per cent coverage and is typically composed of canyon live oak, Oregon grape, trailing blackberry, baldhip rose, and Pacific poison oak.

On more moist sites, Port-Orford-cedar and Douglas-fir or western redcedar and western hemlock dominate the overstory. Small broad-leaved evergreen trees are present but not dominant. Western yew, vine maple, California hazel, white alder, and Pacific dogwood are typical understory species along with rhododendron, salal, Oregon grape, trailing blackberry, twinflower, sword fern, and deerfoot vanilla leaf.

On drier sites, a sclerophyll/Douglas-fir community is dominant. It is characterized by an overstory (with less than 50 per cent crown coverage) of Douglas-fir and a closed canopy of sclerophylls. Tanoak is characteristically the dominant sclerophyll, but Pacific madrone and canyon live oak are also abundant. Typical shrubs are baldhip rose, Pacific poison oak, and trailing blackberry. Similar stands, but lacking Douglas-fir, occur frequently on south slopes.

Knobcone pine often regenerates after wildfires within this zone. It forms extensive, pure stands, particularly on the drier sites.

Special Communities. Except for the unique vegetation found on serpentine sites (described in "Vegetation of Unique Habitats"), dense evergreen chaparral brushfields are the most conspicuous "special community" found within the Douglas-fir/Hardwoods Zone. Typical species are hoary

and green manzanitas, tanoak, canyon live oak, huckleberry oak, Sadler oak, small golden chinquapin, bear bush, box-leaved garrya (silktassel), California coffee berry, gooseberry, currant, mountain whitethorn ceanothus, and pygmy Oregon grape.

Chaparral communities are often fire-induced, particularly in moist areas (e.g. nearer the coast). On dry slopes and sites with south exposures and/or shallow soils, chaparral communities are climax. These climax chaparral communities are dominated by hard-leaved shrubs, such as hoary and green manzanitas. Brushfields dominated by softer-leaved shrubs or stands of tanoak, chinquapin, and Pacific madrone will probably be replaced by conifers, conifer-tanoak or conifer-chinquapin mixtures.

Mixed Conifers Zone. The Mixed Conifers Zone occupies elevations from about 2,500 to 4,500 feet in the eastern Siskiyou Mountains. This zone accounts for approximately 55 per cent of the commercial forest lands on public lands within the SYU (Table 2.1.2-2). It is bounded by the Interior Valleys Zone at its lower limit and by the White Fir Zone at its upper limit.

Forest Composition. Major tree species in this zone are Douglas-fir, sugar pine, ponderosa pine, incense-cedar, and white fir, with Douglas-fir the most abundant. The White fir, as discussed here, is part of the grand fir-white fir species complex common in southwestern Oregon. Some population of trees resemble grand fir while others resemble white fir. In this ES, all true fir populations are referred to as white fir.

Incense-cedar appears to be less common in the eastern Siskiyous. Sugar pine and ponderosa pine usually occur as scattered individuals but give the forests much of their character. The proportion of incense-cedar is greatest on the drier sites. White fir is often present mainly as seedlings and saplings in existing mixed-conifer stands. Other typical tree species include bigleaf maple and Pacific madrone. Characteristic understory species include California hazel, creambush oceanspray, golden chinquapin, creeping snowberry, trailing blackberry, and baldhip rose.

Successional Patterns. Successional relationships have not been studied in the Mixed Conifers Zone. It is known that brushfields frequently develop on disturbed forest lands. These brush communities are dominated by numerous species of ceanothus, golden chinquapin, canyon live oak, Saskatoon serviceberry, hoary manzanita and tanoak.

Successional relationships among the tree species are not completely known, but some general patterns are apparent. White fir is the major climax species over the entire Mixed Conifers Zone. Fires and logging keep white fir from dominating the overstory, but its dominance in reproductive size classes indicates its climax status. On warm, dry habitats, Doulas-fir and/or incense-cedar appear to be climax. On more moist habitats, white fir is climax.

Special Communities. No forested "special types" have been described for the Mixed Conifers Zone.

White Fir Zone. This zone occupies a relatively narrow elevational belt above 5,400 feet in the eastern Siskiyous. It is of minor importance on public lands, providing only about .3 per cent of the commercial forest land in the SYU. The zone grades into the Mixed Conifers Zone at its lower limit.

Forest Composition. White fir is the major tree species within this zone, often forming pure or nearly pure stands. The most common associate is Douglas-fir. Sugar pine, ponderosa pine and western white pine may also be present in small numbers. Incense-cedar is often found on moderately moist sites. Shasta red fir is increasingly common toward the upper limit of the zone.

Characteristic understory species include creambush oceanspray, baldhip rose, Oregon grape, California hazel, Rocky Mountain maple, trailing blackberry, snow dewberry, Saskatoon serviceberry, and golden chinquapin.

Successional Patterns. White fir appears to be the sole climax species on the most frequently occurring habitats. Incense-cedar may be a climax associate on moderately moist habitats and Douglas-fir and/or incense-cedar on drier habitats. White fir probably replaces Shasta red fir on moist sites where mixed stands of the two species occur.

Vegetation of Unique Habitats

<u>Serpentine Soils</u>. Serpentine areas are characterized by unusual plant communities and vegetation. Plants are stunted on serpentine soils in comparison with those on adjacent nonserpentine soils.

Serpentine areas in this discussion are habitats with soils low in calcium and high in magnesium, chromium, and nickel. (A full description of serpentine soils is given in the <u>Soil Inventory of the Medford District</u> pages 14, 97 and 98.) Areas of serpentine soils are shown in Figure 2.1.1-13.

Forest Composition. The outstanding feature of serpentine sites is the Jeffrey pine/grass woodland which occupies the driest serpentine sites between 1,000 and 6,500 feet in elevation. Jeffrey pine is typically the only tree species present, along with a sparse growth of grasses (e.g. lemon needlegrass, big squirreltail, Geyer oniongrass, blue wildrye, and sheep fescue) and an occasional white-leaved manzanita.

Forests intermediate in elevation and moisture are typified by a sparse, dry appearance and are dominated by a mixture of Douglas-fir, incense-cedar, Jeffrey pine, sugar pine, and knobcone pine. Associated with these trees is evergreen brush including huckleberry oak, tanoak, red huckleberry, box-leaved garrya (silktassel) and Oregon myrtle.

Other community types on serpentines include: (1) Port-Orford-cedar/Douglas-fir stands in ravines and draws, with a dense, shrubby understory and (2) higher elevation forests dominated by white fir, Douglas-fir, and western white pine, singly or collectively, over an understory of common beargrass and pine-mat manzanita.

Serpentine Indicator Plants. Common serpentine indicator plants include Jeffrey pine, podfern, dwarf ceanothus, common woolly sunflower and small-flowered willowweed.

Streamside (Riparian) Vegetation. Oregon ash and Port-Orford Cedar are very characteristic species of streamside habitats in the interior valleys within Josephine SYU as well as in the adjacent, higher elevation forest zones. Bigleaf maple also occurs commonly. Understories vary widely from nearly nothing under dense stands to herbaceous (with sedges being characteristic) or densely shrubby types.

Aquatic Vegetation

Unless otherwise noted, aquatic vegetation data has been drawn from Fundamentals of Ecology (Odum, 1959) and Principles of Field Biology and Ecology (Benton and Werner, 1958). Aquatic plant communities are not as geographically differentiated as terrestrial plant communities (Lang, 1976)--for the most part, the occurrence of aquatic plant species is

"universal." Also, there are no distinct boundaries in nature between the habitats and categories presented. Gradual changes and gradients characterize the step from "pond" to "lake" environments, from "running water" to "standing water" habitats, and from "near-shore" to open-water" plant communities.

Lentic (Still Water) Habitats

Lentic habitats include lakes, ponds, and bogs.

Pond and Lake Communities. All but one of the bodies of standing water in the JSYU are considered ponds. Lake Selmac is the only water body large enough to be considered a lake. Lentic environments in the JSYU generally exhibit two subzones-the littoral (shallow, near-shore) zone and the limnetic (open-water) zone (Figure 2.1.2-4).

Littoral (near-shore) Zone. This is the shallow water region generally near shore where light penetrates to the bottom. Two main types of vegetation are found within the littoral zone of ponds and lakes: rooted plants (mostly seed-producing plants), and floating green plants called phytoplankton.

Conspicuous rooted plants in this zone include cattails (typha spp.), water lilies, and pond weeds (family potamooetunaceae). Other commonly occuring species include bulrushes, arrowheads, bur reeds, spike rushes, pickerelweeds, water shield, coontail, water milfoils, water weed, naiads, wild celery, and yellow, brown and blue-green algaes.

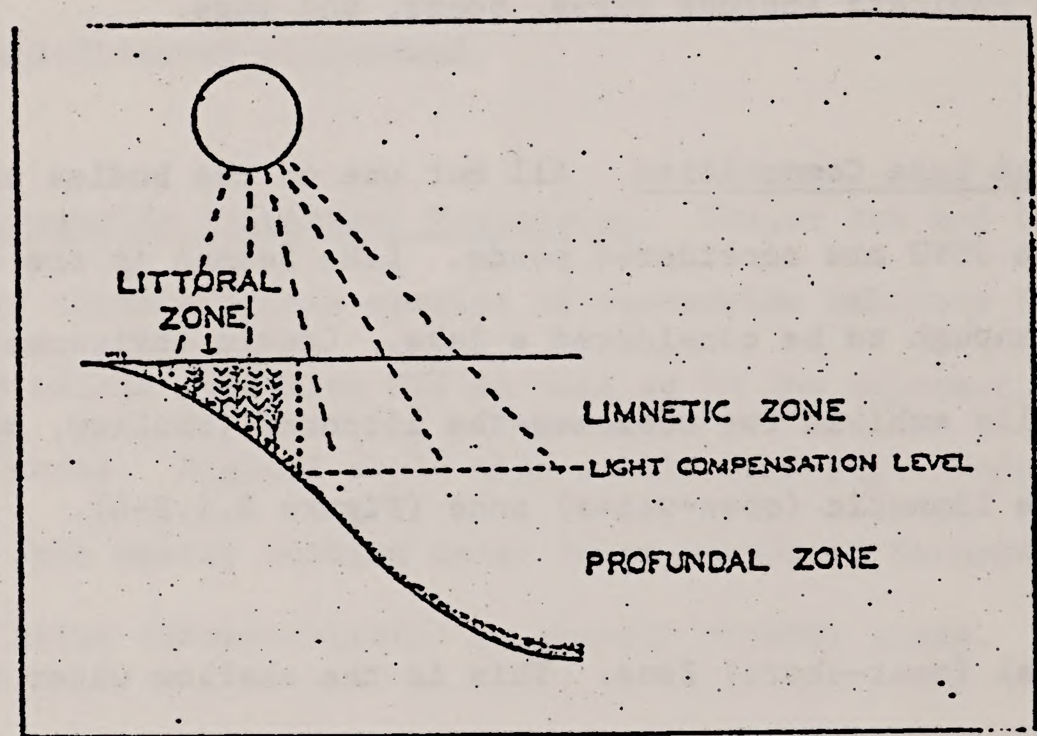

Figure 2.1.2-4 Habitat Zones of Ponds and Lakes. Adapted from Odum, 1959

Limnetic (open water) Zone. This is the deeper, open water zone down to the depth of effective light penetration (where the rate of photosynthesis or food manufacture is equal to the rate of respiration). This zone is sometimes absent in small, shallow ponds. Deeper lakes exhibit other zones, but there are no deep lakes in the JSYU.

Most plants in the open water zone consist of floating microscopic algae, also common in the littoral zone; plus algae-like plants that are capable of movement--the Euglenidae and Volvocidae. Most of the plants in the open water zone are not individually obvious although they sometimes cause the water to appear green.

A characteristic feature of microscopic aquatic plant communities is their marked seasonal variation in population density. High population densities called "blooms" may appear quickly, color the water dramatically, persist for a short time, and then decline, Ponds in the JSYU may exhibit a large early spring bloom and another, usually smaller, bloom in autumn.

The probable cause for phytoplankton blooms is as follows: During the winter low water temperatures and reduced sunlight result in a low rate of plant growth or photosynthesis. Nitrogen, phosphorous, and other nutrients, however, are continually being regenerated by bacterial action, etc., and increase in concentration. With the return of favorable temperature and light conditions in spring, the algae and other organisms

increase rapidly because of the abundant nutrients. Soon, however, the nutrients are exhausted and the bloom disappears. When nutrients again begin to accumulate, blue-green algae, such as Anataena, often are responsible for autumn blooms (Figure 2.1.2-5). These organisms are able to continue to increase rapidly despite a reduction in nitrogen. Ultimately phosphorous, low temperature, or some other factor stops the "bloom".

Darlingtonia Bog Communities. Darlingtonia bogs are characteristically acidic bogs occurring in areas of serpentine rock. The prominent aquatic species is the insectivorous (insect-digesting) California Pitcher-Plant (Darlingtonia californicus). Other species commonly found within these bogs are listed in Table 2.1.2-3. These bog plants are unique in their high tolerance of acid conditions.

Lotic (Running Water) Habitats

Stream and River Communities. In streams and other moving waters two major habitat zones are generally evident: the rapids zone and the pool zone.

The rapids zone is usually shallow water where the speed of the current is great enough to keep the bottom clear of silt and other loose materials, thus providing a firm bottom. This zone is occupied largely by specialized rooted or clinging plants.

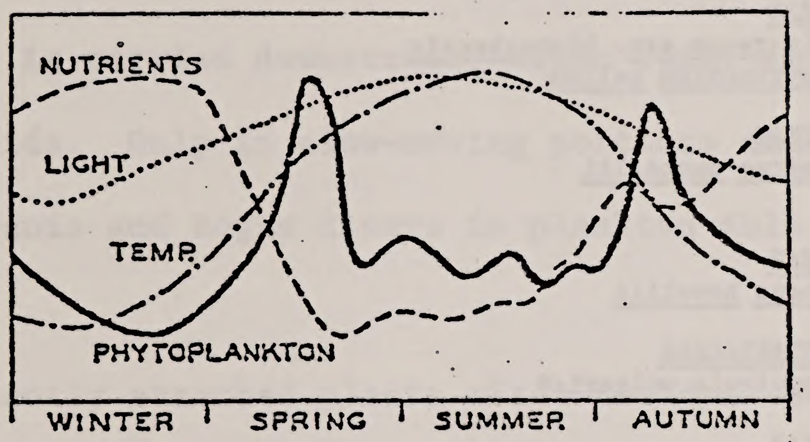

Figure 2.1.2-5: The Mechanism of Phytoplankton Blooms. Odum, 1959.

Table 2.1.2-3

Plants of a Darlingtonia Bog[1]

CARYOPHYLLACEAE
- *Spergularia media*

CONVOLVULACEAE
- *Convolvulus subacaulis*

CYPERACEAE
- *Carex Atrata spectabilis*
- *C. Hispidae Spissa*
- *Heleocharis montevidensis*

GRAMINEAE
- *Hordeum sp.*

HYPERICACEAE
- *Hypericum anagalloides*

IRIDACEAE
- *Iris tenax ssp. klamathensis*
- *Sisyrinchium bellum*

ISOETACEAE
- *Isoetes nuttallii*

JUNCACEAE
- *Juncus howellii*

LENTIBULARIACEAE
- *Pinguicula vulgaris**

LILIACEAE
- *Calochortus tolmei*
- *Camassia quamash*
- *Zigadenus fontanus*
- *Z. paniculatis*

MALVACEAE
- *Sidalcea convillei*

ORCHIDACEAE
- *Cypripedium californicum*
- *Habenaria dilatata*

POLEMONIACEAE
- *Phlox longifolia*

PORTULACACEAE
- *Lewisia oppositifolia*[2]

SARRACENIACEAE
- *Darlingtonia californica*[2]*

SCROPHULARIACEAE
- *Castilleja affinis*
- *Mimulus guttatus*
- *M. lewisii*
- *Orthocarpus purpurascens*

UMBELLIFERAE
- *Foeniculum vulgare*

1 Bob Wille, Unpublished Data, 1972. An April and June Survey of a *Darlingtonia* Bog at approximately 3,000' elevation in southern Josephine County.

2 Listed as "Threatened". USDI, FWS, 1975, Fed. Reg. 40 (127): p. 27828-27924.

* Insectivorous plants

The pool zone is generally deeper water with a reduced current; silt and other loose materials tend to settle here, providing a soft bottom. The soft bottom is more favorable for some kinds of plankton and less favorable for rooted plants.

Phytoplankton, while not as abundant in streams as it is in lakes, is the most prevalent aquatic vegetation found in running water. In small streams, plankton originates in ponds or backwaters connected with streams and is carried downstream, often being destroyed as it passes through rapids. Only in slow-moving portions of streams and in the larger Illinois and Rogue Rivers is plankton able to grow and multiply.

Permanently attached plants often found in streams and rivers include certain green algae (such as cladophores), encrusting diatoms and certain mosses (such as fontinales spp.).

Seeps and Springs. Seeps and springs are numerous and widespread in the JSYU. The plant communities associated with seeps and springs seem to be in a steady state with little change occurring over time. Spring and seep communities are also characterized by relatively small numbers of species. Plankton is absent.

Threatened and Endangered Plants

As provided by the Endangered Species Act of 1973, the U.S. Fish and Wildlife Service published (Federal Register 40(127) 27828-27924

1975; F.R. 41(117) 24524-24572. 1976) lists of more than 1700 species of vascular plants proposed for endangered or threatened status. The Smithsonian Institution, which compiled the list, defined endangered plants as "those species in danger of extinction throughout all or a significant portion of their range". Threatened species were defined as those "likely to become endangered in the future".

A species is considered either threatened or endangered because of any one of the following five factors: "(1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) over utilization for commercial, sporting, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or mandate (sic) factors affecting its continued existence."

Within the JSYU 26 threatened and endangered plant species are known to exist. Another 26 have been identified as possibly existing in the unit, but their presence is not confirmed. One species, Calochortus indecorus (a species of Mariposa lily), may be extinct. In the absence of a detailed inventory specific sites cannot be identified.

Most of these species are adapted to somewhat severe habitats. They typically occur on serpentine soils, in or near seeps and bogs, or on well-drained, droughty soils and rock outcrops. Table 2.1.2-4 lists rare, endangered and unique plant species in the JSYU. If known, their general habitats are included.

Table 2.1.2-4

Threatened and Endangered Plants Known, or Expected, to Occur in the Josephine Sustained Yield Unit[1]

Scientific Name	Confirmed Location	Status[2]
APIACEAE		
Perideridia erythrorhiza	Unconfirmed	T1
Sanicula tracyi	Unconfirmed	E2,E3
Tauschia howellii	Unconfirmed	T1
ASTERACEAE		
Antennaria suffructescens	Josephine Co.; Ore. Mtn. nr. Waldo	T1
Arnica viscosa	Unconfirmed	T1
Aster curtus	Unconfirmed	T1,E3
Erigeron bloomeri var. nudatus	Fiddler Mtn.; nr. Cave Jct.	T1
Erigeron delicatus	Unconfirmed	E2,E3
Haplopappus racemosus congestus	Unconfirmed	T1
Lasthenia macrantha prisca	Unconfirmed	T1
Microseris howellii	Unconfirmed	T1
M Laciniata detlingii	Unconfirmed	T1
M. nutans siskiyouensis	Unconfirmed	E2,T3,D3
Senecio hesperius	Josephine Co.	T1
BERBERIDACEAE		
Vancouveria chrysantha	old Ore. Mtn. Rd.	T1
BORAGINACEAE		
Plaigiobothrys hirtus corallicarpa	Unconfirmed	T1
P. h. hirtus	Unconfirmed	E2,E3
P. lamprocarpus	Unconfirmed	E2,E3
BRASSICACEAE		
Arabis aculeolata	nr. Cave Jct.; nr. Hellgate; Eight Dollar Mtn.	T1
A. koehleri var. stipitata	nr. Cave Jct.	T1
A. modesta	Rogue River canyon	E3
A. oregana	old Oregon Mtn. Rd.	T1

Refer to footnotes at end of Table.

Table 2.1.2-4 (Continued)

Threatened and Endangered Plants Known, or Expected, to Occur in the Josephine Sustained Yield Unit[1]

Scientific Name	Confirmed Location	Status[2]
Thlaspi montanum var. Siskiyouense	Eight Dollar Mtn.; Cow Creek	T1
CARYOPHYLLACEA		
Arenaria paludicola	Unconfirmed	T1
CRASSULACEAE		
Sedum laxum heckneri	Onion & Fiddler Mtns.	T1
ERICACEAE		
Arctostaphylos intricata var. oblongifloia	nr. Waldo	T1
Vaccinium coccinium	Unconfirmed	T1
FABACEAE		
Astragalus applegatii	Unconfirmed	T1
A. purshii var. ophiocenes	Unconfirmed (species confirmed-variety unconfirmed)	E2,E3
Sophora leachiana	Josephine Co.	T1
FUMARIACEAE		
Dicentra formosa oregana	nr. Galice	E2,D3
Gentiana bisete	Illinois R.; Eight Dollar Mtn.	T1,T3
HYDROPHYLLACEAE		
Phacelia capitata	Unconfirmed	E2,E3
P. verna	Josephine County; Cow Creek	T1
LAMIACEAE		
Monardella purpurea	Rogue River; nr. Cave Jct. & Waldo	T1
LILLIACEAE		
Calochortus indecorus	Sexton Mtn.	E2,E3 (possibly extinct)
Erythronium howellii	Grasslands; nr. Cave Jct.	T1
E. oregonum	Unconfirmed	T1
Lilium accidentale	Unconfirmed	E2,E3
L. vollmeri	Unconfirmed (hillside bogs)	T1
L. wigginsii	Unconfirmed (hillside bogs)	T1
Lilium washingtonianum var. minus	Unconfirmed (variety unidentified)	T1

Refer to footnotes at end of Table.

Table 2.1.2-4 (Continued)

Threatened and Endangered Plants known or Expected to Occur in the Josephine Sustained Yield Unit[1]

Scientific Name	Confirmed Location	Status[2]
Schoenolirion bracteosum	Bogs, Serpentine Soils; Eight Dollar Mtn.	T1
LIMNANTHACEAE		
Limnanthes gracilis gracilis	Unconfirmed (seeps)	T1
MALVACEA		
Sidalcea malvaeflora elegans	Deer Crk; nr. Applegate	T1
S. setosa	Unconfirmed	T1
ORCHIDACEAE		
Cypripedium californicum	Bogs; seeps, Eight Dollar Mtn.; nr. Cave Jct. Cow Creek	T1
PORTULACACEAE		
Lewis cotyledon	Whiskey Creek	T1
L. oppositifolia	Bogs; serpentine outcrops, Eight Dollar Mtn.; Illinois R.	T1
SARRACENIACEAE		
Darlingtonia california	Bogs; seeps; streams on serpentine	T1
SCROPHULARIACEAE		
Castilleja brevilobata	Eight Dollar Mtn; nr. Selma	T1
Pedicularis howellii Howell's pedicularis	Southern Josephine Co.	T1
Synthyris missurica hirsuta	Unconfirmed	E2,E3

1 Drawn from Lists published by U.S. Fish & Wildlife Service (Federal Register, 1975 & 1976) & the Oregon Threatened & Endangered Species Task Force (1976).

2 Status:
T1 - Listed as Threatened: USDI, FWS, 1975. Fed. Reg. 40 (127): 27828-27924.
E2 - Listed as endangered: USDI,FWS, 1976 Fed. Reg. 41 (117): 24524-24572
E3 - Considered endangered: Oregon Threatened and Endangered Species Task Force August, 1976.
D3 - Recommended for Deletion by Oregon Threatened and Endangered Species Task Force, August, 1976.

Tree Diseases

Tree diseases are caused by living organisms such as fungi or certain seed plants and are thus part of the biological environment. An unfavorable condition of the nonliving environment such as poor soil or drought quite often acts as a weakening agent making a tree more susceptible to attack by living organisms.

Only the disease organisms that attack living trees and have a significant effect on reducing the wood volume or quality of commercial tree species growing in the JSYU will be addressed in the following discussion. A discussion of all pathogens present would be unduly long and not entirely germane to the proposed action. Unless otherwise identified, data has been taken from Forest Pathology by John Shaw Boyce, 1948.

Root Diseases

Although a few seed plants are parasitic on roots of trees and certain root infections may result in abnormalities short of decay, only those root diseases caused by decay-producing organisms are of major significance in JSYU. Four root-decay organisms are the principle pathogens of below-ground damage to commercial timber in JSYU.

Laminated Root Rot. Almost all coniferous species are susceptible to laminated root rot; however, Douglas-fir and grand fir are highly prone to infection and are most seriously damaged by the disease.

While most fungus diseases are more prevalent on, and cause more damage to, over-mature trees, laminated root rot commonly infects and severely damages young Douglas-fir stands 20-60 years old. The disease occurs on good as well as poor sites and infects vigorous trees as well as trees in poor health. Once the disease becomes established, it spreads through the root system at a rate of one to two feet per year and causes death to groups of susceptible trees, resulting in stand openings usually less than one acre.

The disease ". . . can survive in resin - impregnated tissues of large roots and stumps in the soil for 50 years or more after the trees have been cut or killed" (Hadfield & Johnson, 19). This results in a perpetuation of the fungus, since the young trees of the new stand become infected as soon as their roots come in contact with diseased material from the previous stand.

Spongy Sap Rot. This fungus disease usually attacks coniferous trees but may occasionally be found on hardwoods. Infection commonly spreads through the root system. In western Oregon spongy sap rot is the most important heart rot of western hemlock. Although it is most prevalent in the butt portion of the tree it sometimes extends to a height of 40 feet or more.

Port-Orford-Cedar Root Rot. This fungus disease was found in the heart of the native range of Port-Orford-cedar in southwestern Oregon in 1952 and since that time has spread throughout the range. Today, practically

all of the commercial Port-Orford-cedar in the Josephine SYU is threatened with infection.

The disease infects succulent feeding roots, spreads in the inner bark, and eventually kills the tree. Small trees are killed within a few weeks and larger trees within two to four years, but death is always certain after a tree becomes infected. Infected trees are often attacked by bark beetles and death is hastened.

The fungus spreads either through the movement of swimming spores in the surface water or resting spores through earth movement. As soil becomes saturated, swimming spores move with the surface water and infect new root tips as the surface water percolates into the soil. Resting spores are believed to spread the fungus in soil as it is moved about in road construction, road maintenance and use, logging operations, and on the feet of domestic livestock and big game animals (Roth, Bynum, and Nelson, 1972).

Shoestring Root Rot. Many species of forest trees are attacked by this fungus, but oaks, spruces, and pines are thought to be quite susceptible. The disease is spread through the root system and causes decay of the bark and wood of the roots and root collar and ultimately kills the tree. Decay of the sapwood and heartwood continues after the tree dies.

Infections of the roots of healthy trees are common; however, vigorous trees in good health are readily able to resist attack. Only

trees weakened by poor soil conditions, drought, insect attack or mechanical injury are affected by the disease.

Stem Diseases

Diseases of the main stem (bole) of forest trees are caused by many pathogens. Those exhibiting the greatest significance in JSYU are decay organisms, dwarf mistletoe, and white pine blister rust.

Decay Organisms. Fungus diseases which cause decay of forest trees fall into one of two broad categories - those which cause white rots, and those which cause brown rots. Wood that has been decomposed by fungi that cause white rots generally has the appearance of white pockets or streaks of various sizes, separated by areas of sound wood, or is reduced to a stringy or fibrous condition. The fungi that cause brown rots reduce the wood to a powdery mass, of various shades of brown, with the appearance of what is often described as "dry rot".

Decay organisms are also loosely classed according to their normal location on the tree, eg. butt rots, top rots, or the type of wood that is attacked, eg. sap rot, heart rot (these classifications are not rigidly applied since it is not uncommon to find decay organisms out of their usual position on the tree).

The following species of decay organisms are the major destroyers of above ground portions of commercial forest timber in JSYU. While other decay organisms may be present, they are of minor significance.

White Pocket Rot. The volume loss resulting from white pocket rot far exceeds that from any other decay-producing organism. The disease attacks most conifers but is particularly severe on Douglas-fir, larches, pines, and spruces. The decay may cause a 50 per cent or more loss in Douglas-fir.

Although it attacks both second-growth and old-growth stands, white pocket rot causes more damage to over-mature stands than to young, vigorous trees. The fungus is ". . . usually more prevalent on southerly aspects, on good sites, in pure stands, on steep and upper slopes, and in shallow soils" (Harvey, 1962).

Brown Trunk Rot. A brown, cubical rot of the heartwood of living trees, this disease is often called quinine fungus. The disease attacks only coniferous trees, with Douglas-fir, ponderosa pine, and sugar pine being its principle hosts. It is the most serious decay-producing pathogen of sugar pine.

Although the disease is not very common, it causes extensive damage to individual old-growth trees that have been infected. The appearance of a single conk (fruiting body) on the stem of a tree usually indicates that the entire tree is unmerchantable due to extensive decay. Quinine conks are quite large, not very abundant, and are valuable for medicinal purposes. Though infection generally occurs in the upper portions of the tree through wounds, branch stubs, or broken tops, basal scars caused by fire are also a source of infection.

Pocket Dry Rot. Pocket dry rot or pencil rot is a brown, cubical pocket rot which attacks the heartwood of incense cedar. The disease has ". . . reduced incense cedar, which produces an exceedingly valuable wood, to the rank of an inferior species" (Boyce 1948).

Practically all the loss suffered by incense cedar can be attributed to the pocket dry rot fungus. In overmature stands, up to 50 per cent or more of the gross volume may be lost to decay, with losses averaging approximately 25 per cent.

Red-Brown Butt Rot. Although this brown, cubical heartwood rot rarely attacks hardwoods, many coniferous species, especially Douglas-fir and pines, are common hosts of the fungus.

Infection occurs primarily through basal scars, especially those caused by fire, and, to a lesser extent, through the root system. The incidence of butt rot is often quite high in fire-scarred stands where the fungus is present.

The disease causes the most serious butt rot of old-growth Douglas-fir. The butt log is normally the most valuable in terms of high quality peeler logs or sawlogs. Reduction in strength of the wood in the butt section quite often increases a tree's susceptibility to windthrow and may result in a total loss of merchantable volume due to breakage and other decay-producing organisms.

Shelf Fungus. Shelf fungus is most often found on dead timber, however, it does attack living trees. Douglas-fir, western hemlock, Pacific silver fir, Sitka spruce, and most hardwoods are commonly attacked by this disease. The fungus enters the tree through wounds and causes decay of the heartwood and sapwood.

Dwarf Mistletoe. Dwarf mistletoes are parasitic seed plants which depend upon living hosts for support, water, and most inorganic nutrients. They cause deformities and, often, death of many species of coniferous trees.

Although several species of the disease are present in the JSYU, the one with the greatest economic impact is Douglas-fir dwarf mistletoe. Dwarf mistletoe plants have an inner "root" system for absorption and transfer of food substances obtained from the host and an outer, reproductive aerial system made up of slender, segmented and leafless aerial shoots (Baranyay and Smith, 1972). The parasite spreads by means of an explosive fruit mechanism. When the fruit matures, inside pressure builds up until the seed is ejected. Seeds may travel a distance of 40 feet or more.

The crest of the Cascade Range delineates the westward spread of Douglas-fir dwarf mistletoe, except in southern Oregon where the plant spills over slightly to the west (Shea 1960). It has been estimated that half of the Douglas-fir acreage in Josephine and Jackson counties

is infected with the disease seriously enough to cause damage (Childs and Shea, 1967).

White Pine Blister Rust. This fungus disease of five-needle pines (including western white pine and sugar pine in the JSYU) is somewhat unique in that it depends on two groups of hosts for its existence. Plants of the genus Ribes, e.g. currant or gooseberry plants, are alternate hosts of the disease. Damage to western white pine or sugar pine is proportional to the number and susceptibility of Ribes spp. within and around a stand. Seedlings and small saplings are infected and killed more quickly than pole size and larger trees.

Infection usually enters through a branch. Once the main stem becomes infected, it is only a matter of time before girdling occurs and the tree dies. Occasionally, western white pine and sugar pine trees are killed due to numerous branch infections before the disease reaches the main stem.

High humidity and low temperatures are required for the disease to spread long distances. These factors seem to explain why the disease spreads relatively slowly in the sugar pine region where high temperatures and low relative humidity prevail.

Animals

As previously mentioned (Section 2.1.2.1), plants are major determinants of animal habitat and animals are dependent on their habitats. Habitats may be restricted to one plant community but, more often, they occur within several structurally similar communities. These structurally similar plant communities and their attendant (but not necessarily unique) faunas comprise biotic community units.

Tables 2.1.2-5 and 2.1.2-6 present general lists of mammals and birds, respectively, of potential occurrence in the three major biotic communities designated in the SYU. Preferred animal habitats are listed for each species. The tables are by no means complete listings of all the animals in the area, nor are the animals considered to be restricted to any community unless otherwise noted.

Table 2.1.2-7 presents a general list of the reptiles and amphibians by preferred habitat. It is impossible to assign these species to biotic communities because of the inadequacy of available data. Reptiles and amphibians are incapable of regulating their own body temperatures. Therefore, the majority of them will be found in the chaparral, oak and mixed conifer biotic communities where conditions are suitable for them. A more complete listing of the fauna of the SYU may be found in the Unit Resource Analyses for the Grants Pass, Galice and Glendale Resource Areas, Medford District BLM office.

Table 2.1.2-5 .
Some Mammals of the Josephine Master Unit Listed
by Major Biotic Community and Habitat.

MAMMAL SPECIES	MAJOR COMMUNITY: Chaparral-oak	Mixed Conifer	True Fir			HABITAT: Brushland/thickets	Mature Forests	Grasslands/meadows	Dense Forests	Snags	Riparian/aquatic	Urban/agricultural	Marshes, bogs	Cliffs, ledges	No Obvious Preference	
Pacific Shrew		X											X			
Water Shrew			X								X					
Townsend Male		X				X		X								
California Bat	X															
Long-eared Myotis		X						X								
Big Brown Bat		X								X						
Black-tailed Jackrabbit	X	X				X		X								
Snowshoe hare		X	X			X	X		X		X					
Brush rabbit		X				X										
Mountain beaver		X				X					X					
Beaver	X	X	X								X					
Yellow-bellied Marmot		X	X					X						X		
Townsend's Chipmunk		X					X									
Bobcat	X	X	X												X	
Black Bear		X	X			X	X		X					X		
Coyote	X	X	X												X	
Red Fox			X					X								
Gray Fox	X					X						X				
Raccoon	X	X				X				X	X		X			
Ringtail	X					X				X						
Marten		X	X													
Spotted Skunk	X							X			X	X				
Badger	X	X						X								
California Vole	X					X										
Townsend's Vole		X														
Cougar		X	X				X		X					X		

Table 2.1.2 -5 Continued

MAMMAL SPECIES	MAJOR COMMUNITY					HABITAT									
	Chaparral-oak	Mixed Conifer	True Fir			Brushland/thickets	Mature Forests	Grasslands/meadows	Dense Forests	Snags	Riparian/aquatic	Urban/agricultural	Marshes, bogs	Cliffs, ledges	No Obvious Preference
Silver gray Squirrel	X	X				X			X	X					
Northern Flying Squirrel		X	X				X		X	X					
Botta pocket gopher	X	X					X	X							
Western harvest Mouse	X	X													X
Deer Mouse	X	X													
Bushy-tailed Wood rat	X	X				X	X	X	X	X		X			
Muskrat		X									X				
Mink		X									X				
River otter		X									X				
Roosevelt Elk	X	X					X	X	X						
Black-tailed Deer	X	X				X	X	X	X						

Table 2.1.2-6
Some Birds of the Josephine SYU listed by major Biotic Community and Habitat

			MAJOR BIOTIC COMMUNITY			PREFERRED HABITAT													
BIRD SPECIES	Resident*	Transient**	Chaparral-oak	Mixed Conifer	True Fir	Brushland/thicket	Mature forest	Grassland/meadow	Dense forest	Snags	Rivers-creeks	Lakes-reservoirs	Riparian areas	Sandy shores	Marsh/bog	Urban/agricultural	Open savannas	Cliffs, rims	No obvious preference
Mallard	X		X	X	X						X	X	X		X				
Pintail	X		X	X							X	X	X		X				
Wood duck				X	X						X	X	X		X				
Canada goose		M	X	X							X	X							
Common merganser	X										X	X	X						
Goshawk	X			X	X		X		X										
Red-tailed hawk	X		X	X													X		X
Golden eagle	X		X	X	X			X		X							X	X	
Bald Eagle	X		X	X						X	X	X					X	X	
Osprey	SF		X	X						X	X	X							
Peregrinefalcon		A	X	X						X	X	X					X	X	
Prairie falcon		A	X														X		
Blue Grouse	X			X	X	X			X										
Ruffed grouse	X		X	X		X		X	X										
California quail	X		X	X		X		X								X			
Mountain quail	X		X	X					X										
Ring-necked pheasant	X		X					X								X			
Virginia rail	X		X	X							X				X				
Killdeer	X		X	X	X			X			X	X		X					
Greater yellowlegs		M	X								X	X		X					
California gull	X										X	X							
Band-tailed pigeon	SF			X		X													
Mourning dove	X		X					X								X			
Screech owl	X			X			X			X									
Great horned owl	X		X	X															
Spotted owl	X			X			X		X	X									
Anna's hummingbird	X		X					X									X	X	
Belted kingfisher	X		X	X							X	X	X		X				
Common flicker	X																	X	
Pileated woodpecker	X			X	X		X			X									
Black backed 3 toed woodpecker	X				X		X			X									
White-headed wood'pkr	X			X			X			X									

* Resident Status: S = Spring, F = fall, SU = summer, W = winter, X = year long

** Transient Status: M = migrant (fall & spring), A = accidental

Table 2.1.2-6 Continued

BIRD SPECIES	Resident*	Transient**	MAJOR BIOTIC COMMUNITY	Chaparral-oak	Mixed Conifer	True Fir	PREFERRED HABITAT	Brushland/thicket	Mature forest	Grassland/meadow	Dense forest	Snags	Rivers-creeks	Lakes-reservoirs	Riparian areas	Sandy shores	Marsh/bog	Urban/agricultural	Open Savannas	Cliffs, rims		No obvious preference
Western Kingbird	S-SU			X						X								X	X			
Black phoebe	X			X									X		X			X				
Willow flycatcher	S-SU			X									X		X							
Olive-sided flyc'tchr	S-F					X			X		X											
Violet-green swallow	S-F				X	X						X	X	X	X							
Cliff swallow	S-F			X	X															X		
Scrub jay	X			X				X		X			X		X							
Common raven	X			X	X																	X
Common crow				X																		X
Mountain chickadee	X				X	X			X			X										
Plain titmouse	X			X											X				X			
White-breasted nuthatch	X					X				X		X										
Dipper	X				X	X							X									
Winter wren	X				X				X		X	X										
Common wren	X			X																X		
American wren	X			X																X		
Swainson's thrush	SP SU				X	X		X							X							
Western bluebird	X				X				X		X	X										
Ruby-crowned kinglet	X				X				X													
Cedar waxwing	X				X			X							X							
Starling	X			X						X								X				
Solitary vireo	S-F				X				X		X											

* Resident Status: S = Spring, SU = summer, X = year long, F = fall, W = winter

** Transient Status: M = migrant (fall & spring), A = accidental

Table 2.1.2-6 Continued

			MAJOR BIOTIC COMMUNITY			PREFERRED HABITAT													
BIRD SPECIES	Resident*	Transient**	Chaparral-oak	Mixed Conifer	True Fir	Brushland/thicket	Mature forest	Grassland/meadow	Dense forest	Snags	Rivers-creeks	Lakes-reservoirs	Riparian areas	Sandy shores	Marsh/bog	Urban/agricultural	Open Savannas	Cliffs, rims	No obvious preference
Nashville warbler	S-F			X		X		X											
Yellow-rumped warbler	X			X			X		X										
Townsend's warbler		M		X			X		X										
Hermit warbler	S-SU				X				X										
House sparrow	X		X					X								X			
Western meadowlark	X							X								X			
Red-winged blackbird	X		X	X									X		X				
Brewer's blackbird	X		X													X			
Western Tanager	S-F			X			X		X										
Lazuli bunting	S-F		X			X							X						
Purple finch	X			X				X											
House finch	X		X					X								X			
Lesser goldfinch	X		X			X													
Green-tailed Towhee	S-SU			X													X		
Rufous-sided Towhee	X			X		X													
Savana sparrow	X		X					X					X						
Lark sparrow	S-F																X		
Dark-eyed junco	X		X	X		X													
White-crowned sparrow	X		X	X		X													
Fox sparrow	X			X		X		X											
Song sparrow	X		X			X									X				

* Resident Status: S = Spring, F = Fall, SU = summer, W = winter, X = year long

** Transient Status: M = migrant (fall & spring), A = Accidental

Table 2.1.2-7

Some Reptiles and Amphibians of the Josephine SYU listed by preferred Habitat

Species	Preferred Habitat
Amphibians	
Brown salamander	Shaded brushland
Pacific giant salamander	Riparian areas
Northern rough-skinned newt	Ponds, lakes, riperian areas
Red (Oregon) salamander	Forests
Painted salamander	Forests
Clouded salamander	Timber lands
Tailed frog	Streams, riparian areas
Western toad	Varied habitats
Pacific tree frog	Ubiquitous
Bullfrog	lakes, ponds
Western spotted frog	Riparian areas
Reptiles	
Western pond turtle	Riparian areas
Northern fence lizard	Brushy or sandy areas
Western skunk	Grass, woods, rocky areas
Oregon alligator lizard	Woods, grass
Pacific rubber boa	Forests, grass
Striped whip snake	Brushy grassland
California kingsnake	Moist woodlands
Sharp-tailed snake	Moist areas
Oregon garter snake	Moist forests
Red-spotted garter snake	Forest brushland
Western rattlesnake	Rocky areas

Game Animals

Mammals

The Oregon Wildlife Code (1976) lists the black bear, cougar, deer, elk, mountain goat, mountain sheep, and silver gray squirrel as game mammals.

Black-Tailed Deer. The black-tailed deer is distributed throughout the Medford District, wherever habitat conditions are suitable. All lands within the sustained yield unit are considered to be deer habitat or potential habitat except for those lands in roads, homesites or cities.

Deer in this area do not migrate latitudinally but move between summer (higher altitude) ranges and winter (lower altitude) ranges. Summer range in the SYU lies above about 2500 feet and winter range below it. Lands below 1500 feet elevation are considered year-long deer habitat. Scattered public lands at these lower altitudes serve as seclusion areas for deer amid private land developments and increased human activities. Winter range and year-long range are limited within the area, whereas summer range is fairly abundant (Figure 2.1.2-6).

Crucial winter range is confined to valley bottoms. This range is considered crucial because it is vital for the deer herd and is being

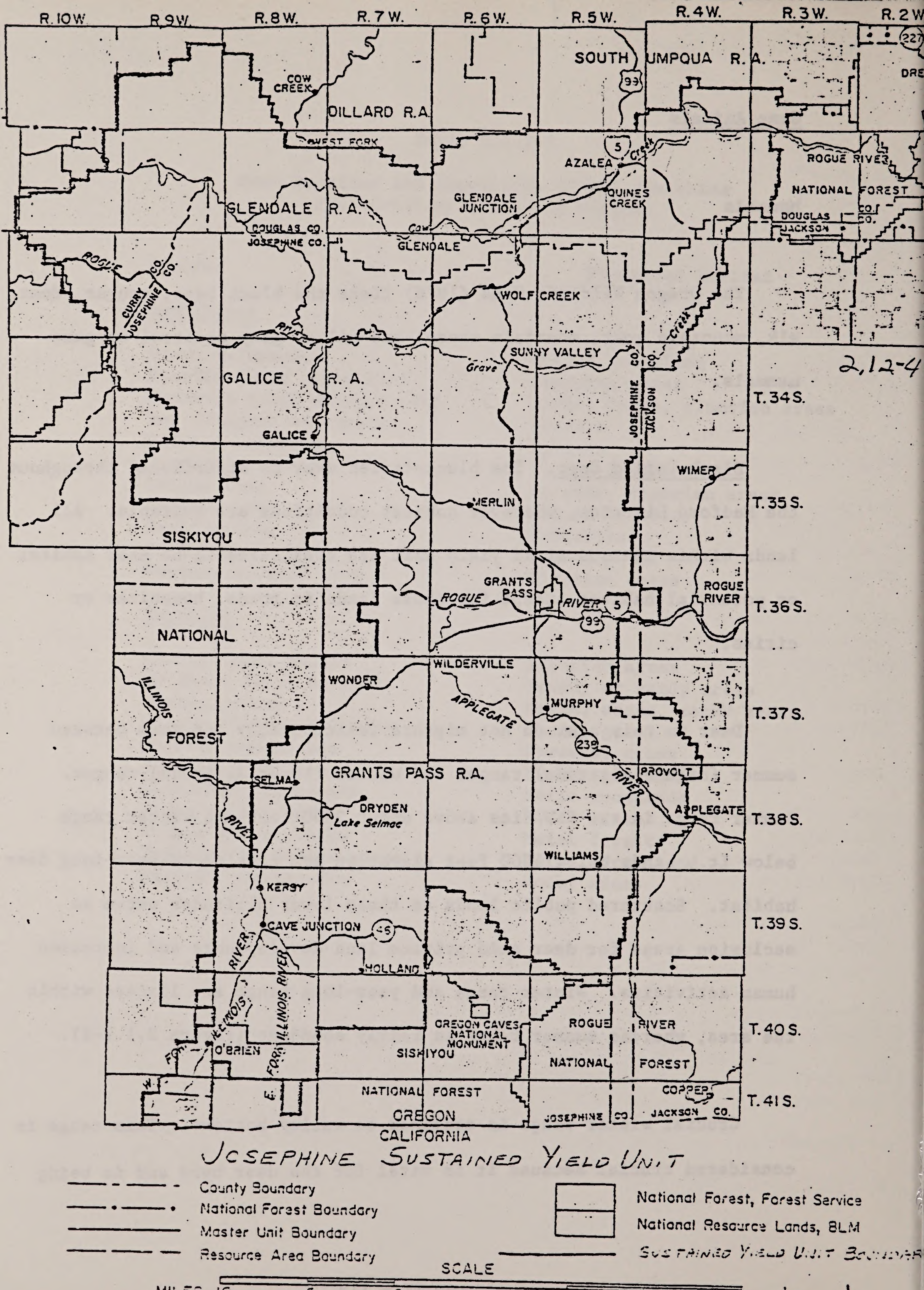

Figure 2.1.2-6 II ~~Deer~~ seasonal ranges. (to be mapped)

steadily diminished by human activity. Highest winter deer densities are on southwest slopes because of increased sunlight, highly palatable and nutritious forage, and light snowpack. Consequently many of these areas are severely over-utilized.

Food, water and cover are good to excellent over most of the area. Human intrusions such as extensive road networks, residential development and recent timber harvests reduce hiding cover and may form barriers that prevent deer movements between desirable habitats.

Black-tailed deer populations in the SYU have declined within recent years. The severe winter of 1968-1969 caused considerable mortality in a short time. Habitat modifications, such as fire control, road construction, improved (?) silvicultural systems and changing private land use patterns, undoubtedly have a greater combined effect on the decline of the deer population over a long time. These factors, however, create problems that are difficult to assess quantitatively over short periods of time and are generally less obvious than mortality caused by phenomona like unusually severe weather.

The Oregon Department of Fish and Wildlife estimates that the deer population of southwestern Oregon declined in 1975 by about 20 per cent below the ten-year average (Figure 2.1.2-7). Among that department's "Big Game Management Units" (BGMU) shown in Figure 2.1.2-8, the Chetco BGMU, Evans Creek BGMU and the Josephine County portion of the Applegate BGMU should be fairly representative of the Josephine Sustained Yield

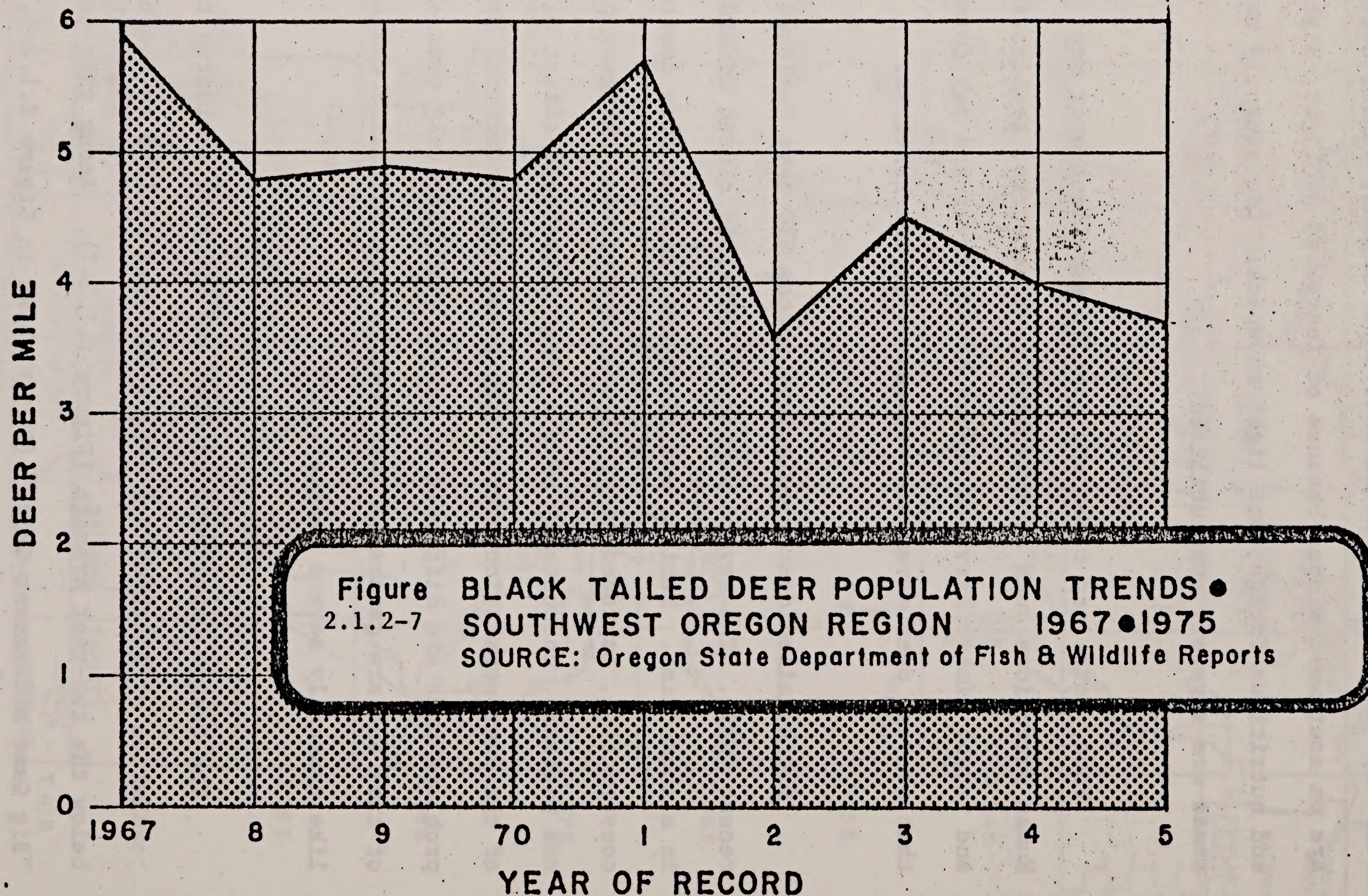

Figure 2.1.2-7 BLACK TAILED DEER POPULATION TRENDS • SOUTHWEST OREGON REGION 1967•1975
SOURCE: Oregon State Department of Fish & Wildlife Reports

Unit. Portions of the Powers BGMU fall within the Josephine unit but are not felt to be representative of the area as a whole.

Analysis of the population trends in the three applicable Big Game Management Units (Chetco, Evans Creek and West Applegate) shows that the estimated deer population decreased by about 18 per cent below the ten-year average in 1975-76. Population trends for each of the three applicable Big Game Management Units are shown in Figure 2.1.2-9.

Roosevelt Elk. Roosevelt elk probably ranged throughout most of the Coast and Klamath Mountain provinces in the historic past. However, it is unlikely that populations were ever very large. In 1910 the Forest Service reported elk were scarce in the Siskiyou National Forest: 26 elk in 1926 and 40 in 1932 (Bailey, 1936).

Past elk populations fluctuated following wild fires that produced vast amounts of forage. These repeated fires created elk habitat by opening large areas in the forest canopy, setting the plant successional stage back to grass-forbs. Man used fire to create range for livestock, clear mining claims, and clear land for agriculture.

Prior to the development of game harvest laws, the market and hide hunters kept elk numbers low. Today's extensive road systems, poaching, limited winter range, and fire control have helped to reduce the size of elk herds to their current levels.

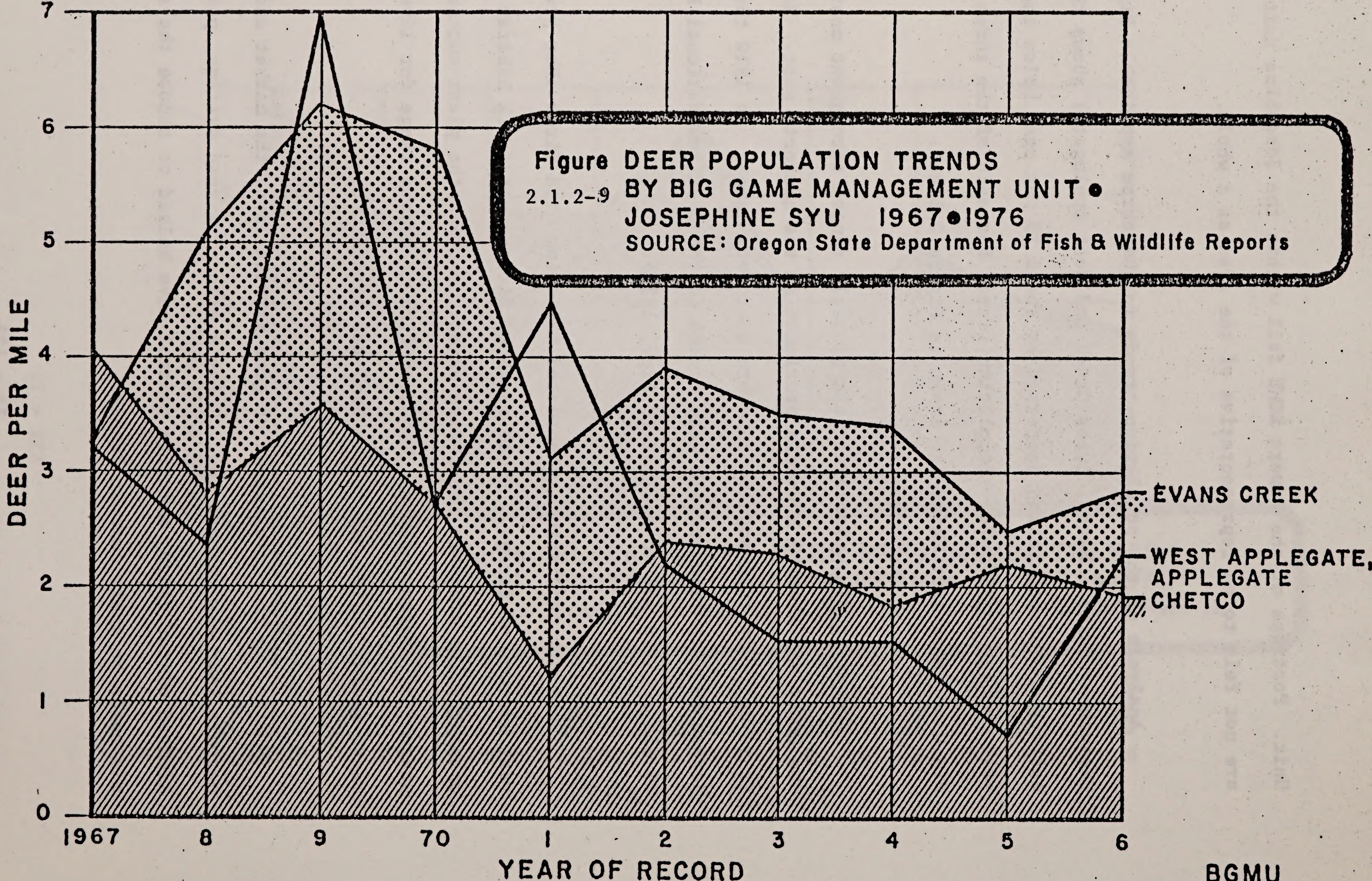
Figure 2.1.2-9 DEER POPULATION TRENDS
BY BIG GAME MANAGEMENT UNIT •
JOSEPHINE SYU 1967•1976
SOURCE: Oregon State Department of Fish & Wildlife Reports
DEER PER MILE
0
1
2
3
4
5
6
7
1967
8
9
70
1
2
3
4
5
6
YEAR OF RECORD
EVANS CREEK
WEST APPLEGATE, APPLEGATE
CHETCO
BGMU

Published population trend data is not available for the elk population within the Josephine SYU, but it is known that the population is small in comparison to the deer population. In 1965, in an effort to meet the increasing demands of elk hunters, the Medford District Office of the BLM officially asked the Oregon State Game Commission (now Oregon Department of Fish and Wildlife) to transplant some elk into the district. The state agency brought 21 elk into the Horse Creek - Peavine Mountain area (1967), 13 elk into the Taylor Ridge area (1975), 16 elk in the Hansen Saddle area (1975), 6 elk into the South Fork Galice Creek area (1975), and another group into a region near Shasta Coast Creek in Curry County.

Hunting was banned in the Chetco BGMU from 1967 to 1974, to give the elk a chance to become established.

Winter range, usually at elevations less than 2,500 feet, is crucial to elk during winter with heavy snowpack. Because winter range is less extensive than summer range, it is usually in poorer condition and competition with deer and domestic livestock is more severe. Elk use in the SYU is year-long and non-migratory, although herds often move to lower elevation in response to deep snows in winter.

Herd names and estimated populations are given in Table 2.1.2-8; herd locations are shown in Figure 2.1.2-10. In addition to these established herds, other small herds roam in the area. Elk have been sighted in the upper Bull Run-Green Mountain Area, and two were seen in 1976 near the headwaters of Williams Creek.

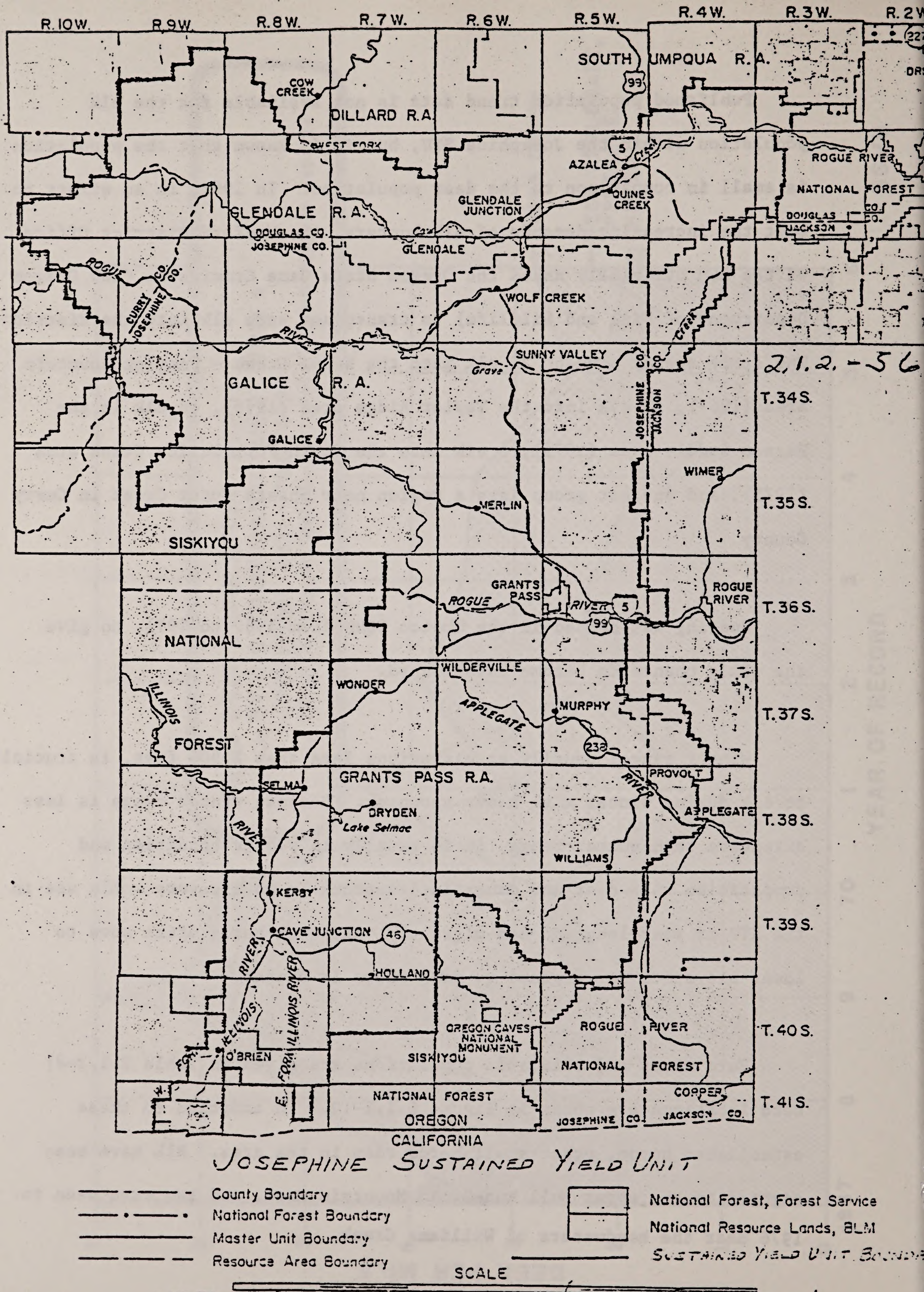

Figure 2.1.2-10. Locations of elk herds.
(To be mapped)

According to food habit studies reported by Harper (1971), trailing blackberry, different grasses and false dandelion are the leading forage plants of Roosevelt elk. Other important forage plants found in the general area include snowbrush ceanothus, blueblossom, blue elderberry, salal, whipple vine and vine maple. All of these food items are common to abundant, due to the number of clearcuts of various ages. However, as natural succession proceeds to replace the brushy seral stages of cutover timberland with maturing trees the food supply diminshes. Any regeneration practice which shortens the herbaceous/brushy successional stage on a particular tract of land ultimately lowers the quantitiy of forage that the land would otherwise produce.

Table 2.1.2-8. Estimated Populations of Known Elk Herds within the Josephine SYU (See also Figure 5)

Herd Name	Estimated Population	Total Range (acres)	Per cent Public Lands	Winter Range (acres)	Per cent Public Lands
Beacon Hill	12-15	7,840	35	1,080	19
Fortune Branch	22	13,000	31	1,789	27
Bear Creek-Buck Ridge	13-14	3,000	50	1,790	54
Elk Valley	75-80	21,000	49	16,040	44
Mule Creek	unknown (6-12 sighted)	17,000	92	10,280	90
Eden Valley	unknown (45 sighted)	4,000	88	880	56
Mt. Peavine	30	Insufficient data			
TOTALS	203-218	65,840		31,859	

Main Source: Oregon Fish and Wildlife Plan, Wildlife Section, Oregon Wildlife Commission, 1974. Fed. Aid. Project FWO/R.

Water availability is satisfactory for elk, but adequate cover is sometimes scarce. Because Roosevelt elk inherently restrict their home ranges to areas seldom exceeding two to three square miles (Harper, 1971), they are extremely vulnerable to habitat changes involving localized areas. The combination of successive clearcuts and extensive partial cuts coupled with intensified road construction has reduced the amount of cover in many preferred elk use areas. Although clearcutting may vastly increase forage abundance, it is necessary for elk to have the protecton offered by dense cover closely adjacent to the clearcut.

Black Bear. Black bears are found throughout the Josephine SYU, and their population appears to be stable or slightly on the increase, although no population trend data is available for the unit. Harvest regulations are probably the main factor for keeping the population stable. The recent classification of bears as game animals by the State Department of Fish and Wildlife (1970 in the Powers & Evans Creek BGMUs; 1968 in the Chetco BGMU; 1967 in the Applegate Unit) has eliminated the continuous incidental harvest of bear throughout the year. Lands within one mile of the Rogue River between Grave and Lobster Creeks have been closed to bear hunting. This "refuge" area is excellent bear country and provides a center of expansion for the bear population.

Perplexingly, concomitant with the suspected increase in the bear population, suitable habitat has recently declined with the advent of intensified road construction, residential development and partial cut

silviculture. Nonetheless, habitat conditions over most of the SYU are considered good to excellent.

In 1970 the State Department of Fish and Game estimated a population of approximately 1180 bears in Josephine County. The 1971 Rogue River Fish and Wildlife Plan estimated that the Rogue Canyon supports 700 to 750 bears. The steep, rocky cliffs above the Rogue provide excellent denning areas, and the roadless region in the "wild section" of the river complements the natural bear habitat.

Mountain Lion (Cougar). The mountain lion is the top carnivore in the Josephine Sustained Yield Unit. These large cats are very secretive and are seldom seen by sportsmen or casual observers. Prior to 1968 the mountain lion was classified as a predator, a classification that allowed unregulated hunting at all seasons. Since that time the cougar has been given game animal status, which allows hunting to be regulated for the benefit of the species. The Oregon Department of Fish and Wildlife estimated (1974) that there were approximately 660 cougars in Josephine County in 1970. The cougar population in the Rogue Canyon was estimated at approximately fifteen animals (ODF&W, 1971). The cougar population appears to be stable or slightly increasing in southwestern Oregon (Gale, 1973), a trend that may be attributed largely to its designation as a game animal.

The cougar is a resident of the inaccessible mountainous forests of the area and is usually closely associated with elk or deer herds. Elk

and deer are a major portion of the predator's diet. High quality cougar habitat is restricted to the few unroaded areas along the Rogue River and its drainages or other comparable regions within the SYU. Human activities such as logging, road construction and residential development are injurious to cougar habitat and have undoubtedly greatly reduced the amount of high quality habitat within the region.

No recent data are available on population trends within the SYU. One cougar was killed in the Pickett Creek area in November, 1975, and poaching probably occurs sporadically throughout the year.

Silver Gray Squirrel. The silver gray squirrel is found throughout the Josephine SYU, with highest populations in the mixed conifer forest. These squirrels are especially abundant in the serpentine area of Mt. Peavine, the Whiskey Creek-Mt. Reuben area and the low foothills of the Illinois Valley.

The silver gray squirrel is a non-hibernator and feeds preferentially on the seeds of sugar pine, Jeffrey pine and the fruits and nuts of other species.

All habitat components are present within the unit in sufficient quantity to permit this squirrel to increase its population. Little data is available on population trends, but field observations indicate that the population is stable.

Birds

Upland Game Birds. Upland game birds include quail, grouse, dove and pigeon.

California Quail. The California quail (valley quail) is a non-migratory resident throughout the unit, generally found in valleys and foothills at elevations of less than 2000 feet. Valley quail range overlaps mountain quail range in several localities. Farms, grasslands, brushfields and riparian habitats are important use areas.

Severe winters, especially extended periods of snow cover, are responsible for high mortality rates among these birds. Such occasional mortalities, however, are generally not as significant to the population over long periods of time as the gradual, but persistent, progressive loss of suitable habitat. Probably the greatest single factor responsible for suspected recent population declines in quail is the boom in rural residential developments and the advent of "clean" farming with associated herbicide and pesticide applications.

Mountain Quail. The mountain quail is a non-migratory resident found throughout the Josephine unit in mountainous regions. Brushy openings in forested areas are preferred habitat. These quail forage in the edges of clearcuts, especially during summer and fall when fruits are ripening. Seeds and insects are eaten when fruits are not available. Mountain quail are abundant in the upper Cow Creek drainages, Deer Creek and Williams Creek regions and the Mt. Peavine - Rum Creek area. During

periods of snow cover, mountain quail are forced to lower elevations and compete for food with California quail.

Population trend data, collected along big game census routes by the State Department of Fish and Wildlife (Rogue District), indicated a population density of 2.23 mountain quail per census mile in 1975. In 1974 the estimated population was 1.05 per mile (ODF&W, 1975).

Blue Grouse. Blue grouse are the more common and widespread grouse in the unit. They are non-migratory and are seasonally associated with the higher elevation white fir community and with clearcut stands. Clearcuts are utilized primarily during late summer and autumn when ripe fruits are available. Basic habitat components for these grouse appear to be adequate in the unit.

The 1975 road census conducted by Oregon Department of Fish and Wildlife showed an average of .11 blue grouse per mile in the southwestern region of Oregon, an increase of .05 over 1974.

Oregon Ruffed Grouse. The ruffed grouse is a year-round resident of the mixed evergreen, deciduous and riparian forests. Preferred habitat is meadow are· intermingled with forests. The population of the SYU is low and fluctuates widely every year, as do populations of other species of grouse.

The amount of suitable habitat is adequate within the SYU and could probably support a greater population of this species. There are no known population concentrations in the unit.

Mourning Dove. Mourning doves are important game birds in the Josephine SYU. The species is migratory and most of the Josephine population probably winters in southern California, Arizona or Baja California. However, a few mourning doves can generally be found in the area during winter. It is not known whether these wintering birds are part of a yearlong resident population or if they are migratory individuals that move into the area from farther north to overwinter. Doves are abundant in the unit from spring through early autumn. Preferred habitat is open or semi-open grainfields, weedy fields, pastures, brushy roadsides and open woods with abundant seed sources. Large flocks often congregate in stubble fields to feed. Doves are seldom seen in heavily timbered coniferous forests. Nesting occurs in most of the foothills and valley areas throughout the Medford District.

Roadside counts conducted within the Rogue District (ODF&W designation) show a fluctuating number of doves observed per mile of census route since 1971 (ODF&W, 1975). Birds observed per mile were: 5.5 in 1971; 4.6 in 1972; 2.5 in 1973; 4.6 in 1974 and 4.4 in 1975.

Band-Tailed Pigeon. Band-tailed pigeons, the only wild pigeon native to Oregon, may occasionally be found in autumn within the forests

of the Josephine SYU. Some nesting may occur in the region but most nesting activity occurs west of the SYU in the Coastal Forest region of the state. Clearcut units and fruit-producing hardwood areas located near ridge passes are heavily utilized by pigeons, especially during migrations. Preferred forage items include acorns, pine seeds, madrone berries, elderberries and a variety of other fall-ripening fruits.

No local population concentrations of pigeons are known within the Josephine unit. Data collected by ODF&W (1975) at Mineral Springs and tideflat concentration areas, outside the Josephine Unit, show a 39 per cent increase in the pigeon population since 1974.

Furbearers

The Oregon wildlife code lists the beaver, fisher, marten, mink, river otter and raccoon as furbearers in the State. Populations of most of these species appear to be stable although no data is available on population trends. Annual trapping records furnish excellent information on the distribution of these animals. However, this data cannot be applied in determining population trends because high fur prices increase trapping effort while a depressed market generally decreases effort.

In addition to those animals officially listed as furbearers by the State, the coyote, bobcat, red fox, skunks and muskrat are valued for their fur. These animals are unprotected by official trapping regula-

tions. Recent increases in fur prices have brought about an associated increase in trapping efforts for all furbearing species.

Non-Game Animals

Data regarding the status of non-game animal populations are insufficient to allow analyses of their populations to the same depth that is possible for game species. It can be stated however, that existing animal populations (both game and non-game species) reflect the dramatic changes that have occurred within the Josephine SYU since civilization moved to western Oregon.

Animals that are unable to tolerate human intrusion or that are dependent on climax or old growth vegetational communities, have generally declined as man has increased his presence in the environment. Examples of species which exhibit this type of population trend are the northern spotted owl, wolverine and timber wolf.

Species that are more tolerant of human intrusion or are flexible in regard to habitat preference have been better able to adapt to changes in their environment. Existing populations of these species are expected to be stable. Tables 2.1.2-5 through 2.1.2-7 illustrate that a major portion of the existing fauna in the SYU do not have restrictive habitat preferences.

Other animal populations may flourish in close association with man. These species established new populations in the area or expanded their populations with the coming of man. Existing populations of this type include the starling, house sparrow, coyote, house mouse and Norway rat. Populations of these species are probably expanding.

Endangered Species

One bird species of potential occurrence in the SYU is currently listed as officially endangered by the most recent U.S. Fish and Wildlife service list (1976). This species, the peregrine falcon, is afforded strict protection under the law. It is unlawful, except under permit, to take such species within the United States. "Take" is defined by the Endangered Species Act (1976) as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct".

In addition to the peregrine falcon, three other species of animals of potential occurrence in the unit are listed as threatened with endangerment by the U.S. Fish and Wildlife Service (1973) or state organizations (Oregon Endangered Species Task Force; Oregon Department of Fish and Wildlife). All known rare or endangered animals of possible occurrence in the unit are listed in Table 2.1.2-9.

The northern bald eagle is a summer resident and winter visitor in the unit. These birds are usually associated with large bodies of water

such as the Rogue River or various lakes. A joint effort by the Oregon Department of Fish and Wildlife, BLM and Forest Service in 1970 identified several large nests, presumed to be eagle nests, in the unit.

The peregrine falcon is an uncommon resident in the unit. They may fly over public lands in the Rogue River Canyon, although there have been no recent sightings and no confirmed nests have been reported. Steep bluffs and cliffs along the Rogue River should provide suitable nesting habitat.

Table 2.1.2-9

Animals of Potential Occurrence in the Josephine SYU
Classified as Endangered or Threatened.

Species	Classification 1/	List 2/
Peregrine Falcon	E	U.S.; Oregon
Northern Bald Eagle	T	Oregon; (Proposed-U.S.)
Northern Spotted Owl	T	Oregon; (SU in U.S.)
Wolverine	T	Oregon; (SU in U.S.)

1/ E = endangered; T = threatened with endangerment

2/ U.S. list includes official Endangered and Threatened Species list, plus and unofficial Status Undetermined list compiled by the U.S. Fish and Wildlife Service. Oregon list includes official State list of threatened or endangered species and a list of species unofficially classified as "status undetermined" by the Oregon Endangered Species Task Force.

The northern spotted owl ("threatened" in 1973 U.S. Fish and Wildlife List; "threatened" in 1975 ODF&W list; unlisted in the 1976 U.S. Fish and Wildlife List) is a year long resident in the unit. Although the owl is not included on the official U.S. list of endangered species, it has received a great deal of interest from the BLM, USFS, and other agencies because data indicate that it is dependent on old growth forests. Specifically, the spotted owl nests in large, standing trees with broken tops ("snags"). Suitable nest trees are located only in old growth forests and old growth forests are rapidly disappearing. Therefore, as nesting habitat declines the future of the spotted owl will be in jeopardy unless adequate protective measures are taken.

Seventeen additional species which may occur in the JSYU have been identified by either the Federal or State investigatory agency as "Status Undetermined". Status undetermined indicates that additional information is sought on species, populations, and area of occurrence. Such classification is often a preliminary stage to placement on an endangered or threatened list. The seventeen species of undetermined status are listed in Table 2.1.2-10.

The American osprey ("status undetermined" 1973 USFWS list) is a summer resident in the unit and feeds primarily on fish from the Rogue River and its tributaries. Inventories conducted along the Rogue by BLM and USFS during the past 10 years indicate that the local osprey populatio is stable. No nests have been confirmed but the birds have been observed flying over the area.

Table 2.1.2-10

Animals of Potential Occurrence in the Josephine Sustained Yield Unit Classified as "Status Undetermined"

Species	List 1/
American Osprey	U.S.
Burrowing Owl	U.S.; Oregon
California Mountain King Snake	Oregon
Common King Snake	Oregon
Ferruginous Hawk	U.S.; Oregon
Fisher	U.S.; Oregon
Flammulated Owl	Oregon
Goshawk	Oregon
Pigeon Hawk (Merlin)	Oregon
Pileated Woodpecker	Oregon
Pine Marten	U.S.; Oregon
Red Fox	Oregon
Ringtail Cat	Oregon
Sharp-Shinned Hawk	Oregon
Swainson's Hawk	Oregon
Tailed Frog	Oregon
White-Headed Woodpecker	Oregon

1/ Oregon list includes official State list of threatened or endangered species and a list of species unofficially classified as "status undetermined" by the Oregon Endangered Species Task Force.

U.S. list includes official Endangered and Threatened Species list, plus an unofficial Status Undetermined list compiled by the U.S. Fish and Wildlife Service. Oregon list includes official State list of threatened or endangered species and a list of species unofficially classified as "status undetermined" by the Oregon Endangered Species Task Force.

No information is available pertinent to other rare or endangered species of wildlife of potential occurrence within the unit.

Fishes

The aquatic habitats of the Josephine SYU support diverse populations of game and non-game fish species. Cold water anadromous fishes (fishes that are reared in fresh water, migrate to the ocean and return to fresh water to spawn) are especially well represented with six species. Two species of cold water resident game fish and four species of warm water game species are also represented in the area. Ten species of non-game fish have been identified in the unit (see Table 2.1.2-11). No endangered species of fish are known to occur in the unit.

Approximately 202 miles of Class I and 188 miles of Class II streams of direct importance to fisheries flow through public lands in the Josephine SYU. "Class I streams" are defined by the State of Oregon as waters which are valuable for domestic use, are important for angling or other recreation and/or are used by significant numbers of fish for spawning, rearing or migration routes. Streamflows in Class I streams may be either perennial or intermittent.

"Class II streams" are defined as any headwater streams or minor drainages that generally have limited or no direct value for angling or other recreation. They are used by few, if any, fish for spawning or rearing. The principal value of Class II streams lies in their influence on water quality or quantity in Class I waters downstream. Figure 2.1.2-11 shows the locations of Class I stream habitats within the unit.

Table 2.1.2-11
Fishes Identified in the Josephine SYU

I. Game Fish

A. Cold Water Anadromous
- Summer steelhead
- Winter steelhead
- Spring chinook salmon
- Fall chinook salmon
- Coho salmon
- Sea-run cutthroat trout
- American shad
- White sturgeon
- Green sturgeon

B. Cold Water Resident
- Rainbow trout
- Resident cutthroat trout

C. Warm Water Resident
- Brown bullhead catfish
- Largemouth bass
- Black crappie
- Bluegill

II. Non-Game Fish
- Pacific lamprey 1/
- Carp
- Redside shiner
- Blackside dace
- Squawfish 2/
- Klamath small scale sucker
- Coastrange sculpin
- Prickly sculpin
- Reticulate sculpin
- Threespine stickleback

1/ Lamprey are not true fishes.
2/ Not found in the Rogue Drainage

Cold Water Game Fishes

Both anadromous and resident species are considered cold water game fishes.

Anadromous Game Fishes. The anadromous game fishes are undoubtedly the most economically important fishes in the waters of the Josephine SYU. The anadromous species of the unit are the coho salmon, chinook salmon, steelhead, sea-run cutthroat, American shad and the white sturgeon.

In addition to their significance within the unit, the fall chinook and coho salmon spawned in the SYU are of considerable importance to the ocean sport and commercial fisheries. (See Josephine Master Unit Planning Area Analysis-Medford District Office, BLM).

Strict habitat requirements including food supply, water temperature, dissolved oxygen, depth, current and type of stream bottom must be met by individual streams before anadromous fishes can complete their elaborate life cycles. These life cycles involve spawning and rearing in freshwater streams, juvenile migration to the ocean where sexual maturity is reached and then a return to the natal stream for reproductive purposes.

Some species of anadromous fishes may spend up to three years in fresh water streams before migrating to the ocean. Any stream occupied by these fish must contain sufficient flow to provide the necessary habitat components including food, shelter and a suitable physical environment. Because these fish must migrate to the ocean, the stream must also provide adequate flow for their passage to it. Approximately .8 foot depth is required for chinook and .6 foot depth is required for steelhead and coho. Any variation in stream depths below these minimum requirements will impede passage. Table 2.1.2-12 presents data showing the current status of salmonid habitat in the unit.

Because these fish have such rigid habitat requirements in addition to the fact that they must return to their natal streams for reproduction,

Table 2.1.2-12/13
Salmonid Fish Species Habitat and Current Status
Josephine SYU

Species	Habitat Type	Stream Miles 1/ (Total)	(Public)	Habitat (quality)	Status 2/ (quantity)
Summer Steelhead	adult migration	216.5	76.7	fair	stable
	spawning	135.7	42.2	fair	decreasing
	rearing	193.1	76.7	poor	decreasing
	juvenile migration	216.5	76.7	poor	decreasing
Winter Steelhead	adult migration	450.7	114.2	good	stable
	spawning	435	112.2	fair	decreasing
	rearing	339	107	poor	decreasing
	juvenile migration	418	112	poor	decreasing
Spring Chinook Salmon	adult migration	59	34.5	poor	decreasing
	spawning	6	0	fair	stable
	rearing	6	0	fair	stable
	juvenile migration	59	34.5	good	stable
Fall Chinook Salmon	adult migration	178	54	fair	stable
	spawning	178	54	fair	stable
	rearing	56	8	poor	decreasing
	juvenile migration	178	54	fair	stable
Coho Salmon	adult migration	376	95	good	stable
	spawning	376	95	good	stable
	rearing	301	114	poor	decreasing
	juvenile migration	376	114	poor	decreasing
Sea-run Cutthroat	adult migration	451	114	good	stable
	spawning	382	78	fair	decreasing
	rearing	339	107	poor	decreasing
	juvenile migration	418	112	poor	decreasing
Resident Cutthroat	spawning	574	185	fair	decreasing
	rearing	332	150	fair	decreasing
Resident Rainbow	spawning	339	77	fair	decreasing
	rearing	356	167	fair	decreasing

1/ Class I stream environment
2/ Based on ten year period 1965-75

past disturbance of stream habitats within the SYU is reflected by existing populations which are considerably diminished from pre-disturbance levels. Significant population declines in the Rogue can be attributed to such factors as poorly designed irrigation canals, dams built without fishways, mining and logging activities which alter flows and increased sedimentation and clearing of riparian vegetation which increased water temperatures in spawning and rearing areas. Unfortunately it is impossible to quantify the extent of population declines caused by such practices in past years because of a general lack of data.

Contemporary awareness of the need to conserve aquatic habitat has led to the development of state and federal programs which have corrected many past deficiences in anadromous sportfish management. Many streams are now stocked with hatchery-raised fish in attempt to augment natural populations. Oregon Department of Fish and Wildlife estimates that 800,000 lbs. of spring chinook, 20,000 lbs. of coho and 150,000 lbs each of summer and winter steelhead were released into the Rogue drainage in 1975.

Water quality standards have been prescribed by state and federal agencies. As a result the decline in anadromous populations has slowed, but has not stopped, although the steelhead population in the Rogue has apparently stabilized. Figures 2.1.2-12 through 2.1.2-14 show fish counts at the Gold Ray Dam on the Rogue River, by anadromous species for every year between 1950 and 1975. No apparent population trends are discernible for anadromous game fishes in the SYU, with the exception

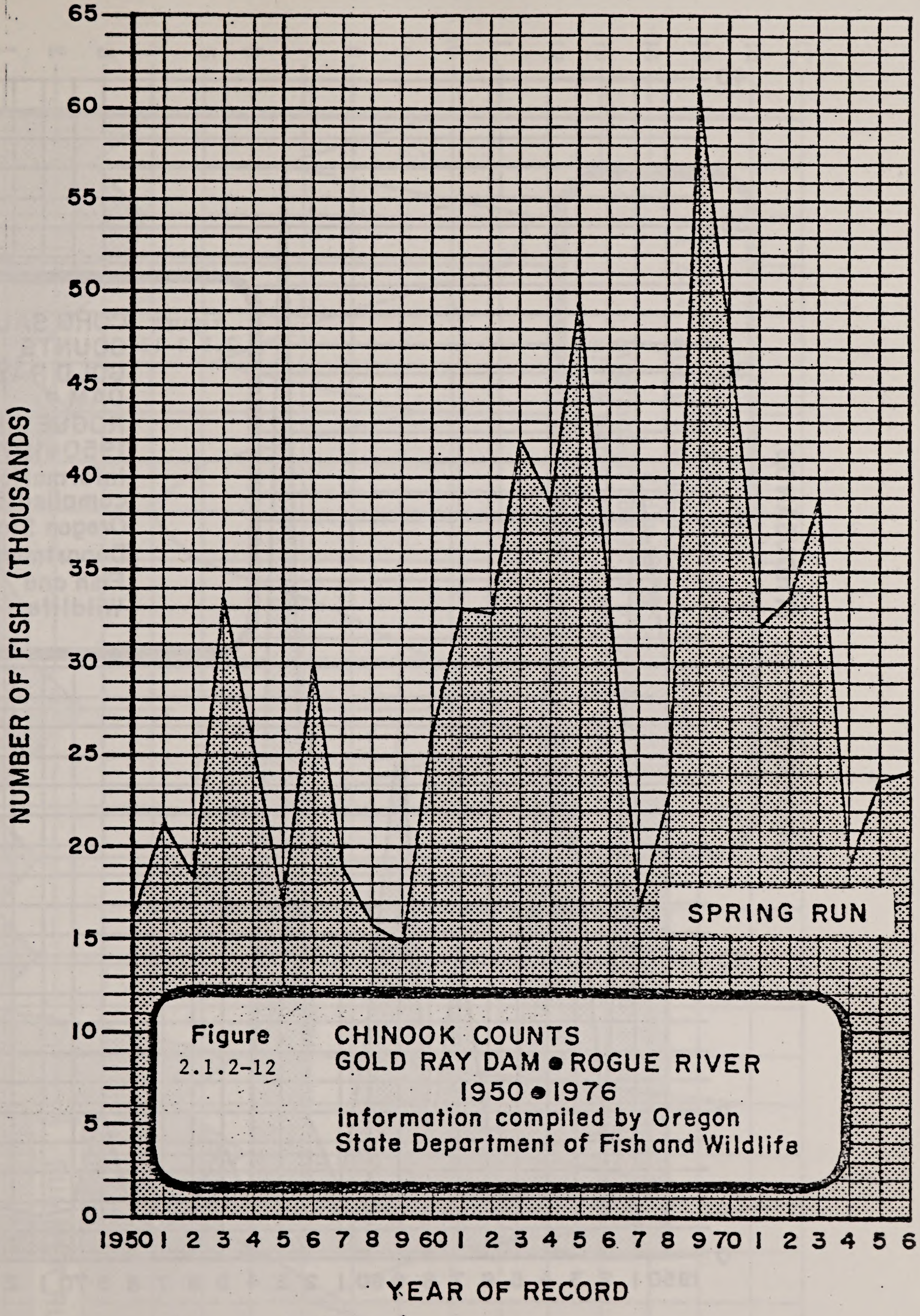

Figure 2.1.2-12 CHINOOK COUNTS GOLD RAY DAM • ROGUE RIVER 1950 • 1976 information compiled by Oregon State Department of Fish and Wildlife

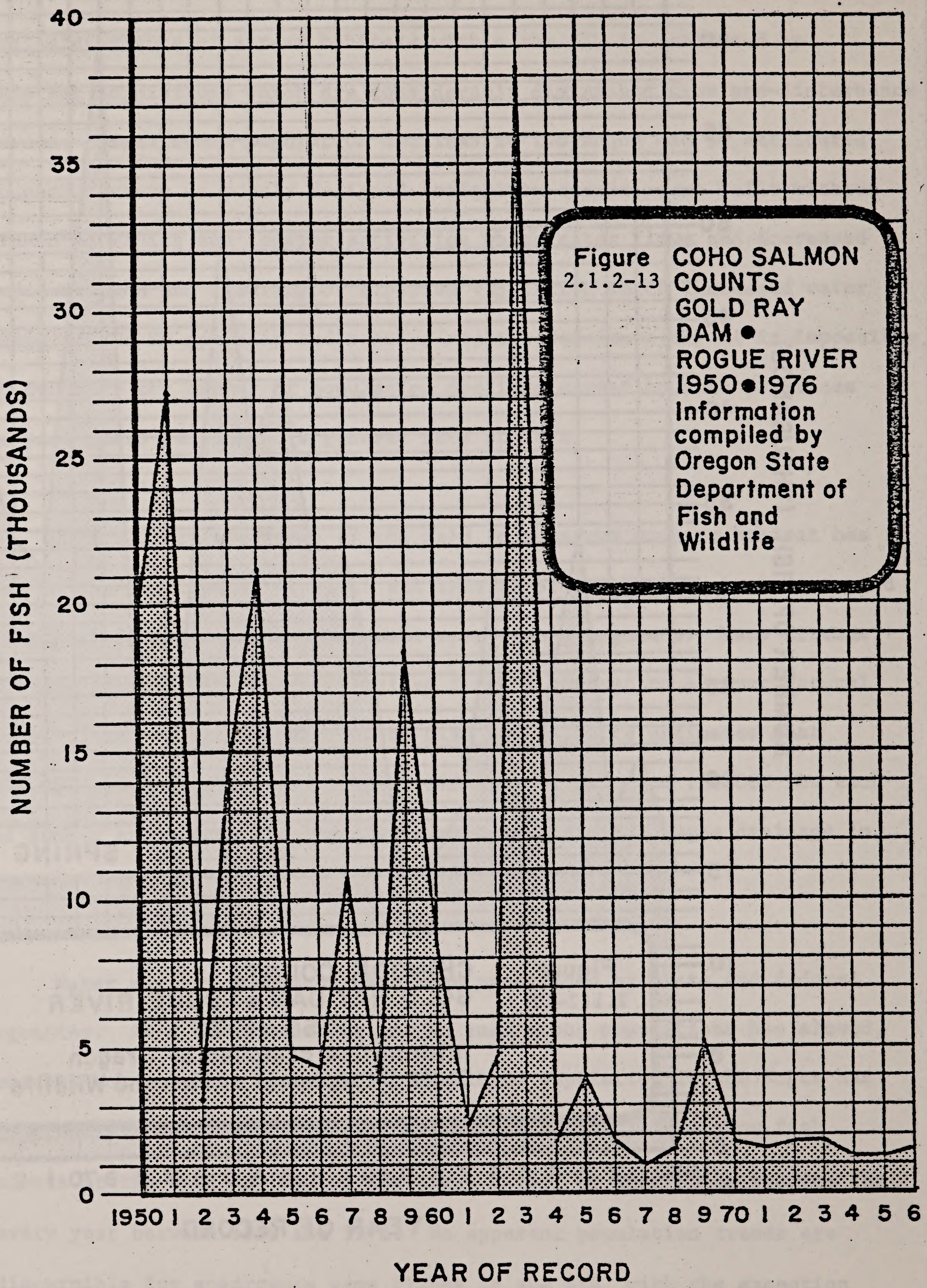

Figure 2.1.2-13 COHO SALMON COUNTS GOLD RAY DAM • ROGUE RIVER 1950•1976
Information compiled by Oregon State Department of Fish and Wildlife
NUMBER OF FISH (THOUSANDS)
40
35
30
25
20
15
10
5
0
1950 1 2 3 4 5 6 7 8 9 60 1 2 3 4 5 6 7 8 9 70 1 2 3 4 5 6
YEAR OF RECORD

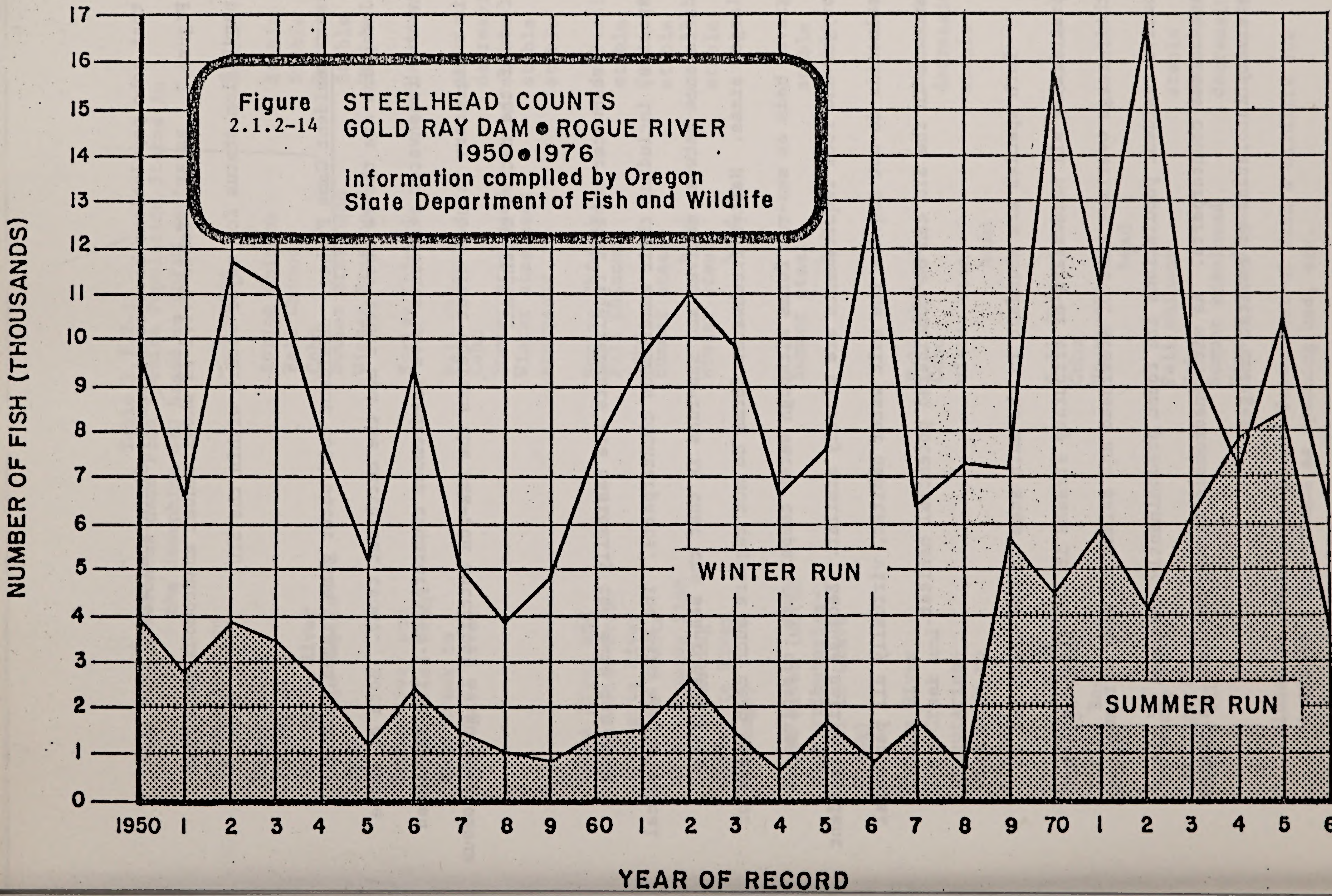
Figure
2.1.2-14
STEELHEAD COUNTS
GOLD RAY DAM • ROGUE RIVER
1950 • 1976
Information compiled by Oregon
State Department of Fish and Wildlife
NUMBER OF FISH (THOUSANDS)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
WINTER RUN
SUMMER RUN
1950
1
2
3
4
5
6
7
8
9
60
1
2
3
4
5
6
7
8
9
70
1
2
3
4
5
6
YEAR OF RECORD

that coho populations have considerably diminished since 1964 (see Figure 2.1.2-13). Table 2.1.2-13 shows annual anadromous game fish population status for major waters within the SYU.

Resident Game Fishes. Resident cold water game fishes in the Josephine are the rainbow trout and the cutthroat trout. Both of these native freshwater residents have anadromous counterparts. The steelhead is a migratory rainbow trout whereas the sea-run cutthroat is an anadromous form of the native cutthroat.

Freshwater habitat requirements are basically the same for both species, including their anadromous counterparts. The main morphological difference between natives and sea-runs is that the sea-runs attain larger sizes. Native freshwater forms do not require such deep water or gravel beds as sea-run forms although water temperature, dissolved oxygen and food requirements are closely similar. Because native resident salmonids do not require the salt water habitat, virtually all perennial streams in the SYU can be considered potential habitat.

Both species are abundant in the main stem of Cow Creek and in practically all headwaters of tributary streams in the area. While their range overlaps that of steelhead and salmon in many streams, native resident populations are found predominantly upstream of their anadromous counterparts. As with anadromous forms, resident salmonids are very intolerant of habitat changes.

Table 2.I.2-13
Anadromous Game Fish Species Population Status in the Josephine SYU based on ODF&W estimates

Stream Section	Species	Status
Rogue River (Mouth of Applegate River to Savage Rapids Dam)	Spring Chinook	Stable
	Fall Chinook	Stable
	Coho	Decreasing
	Summer Steelhead	Stable
	Winter Steelhead	Stable
Rogue River and tributaries from Mule Creek to Applegate River	Spring Chinook	decreasing
	Fall Chinook	stable
	Coho	decreasing
	Summer steelhead	stable
	Winter steelhead	stable
	sturgeons	stable
Rogue River and tributaries from Applegate River to Upper Limits of Anadromous fish (Not including Applegate River drainage)	Spring Chinook	decreasing
	Fall Chinook	stable
	Coho	decreasing
	Summer steel-head	stable
	Winter steel-head	stable
Rogue River (north side tributaries-Marial to Grave Creek)	Summer steel-head	stable
		stable
Umpqua River (Cow Creek and tributaries-West Fork to Anchor)	Fall chinook	decreasing
	Coho	decreasing
	winter steel-head	stable
Illinois River Drainage (Area inside Resource Area)	fall Chinook	stable
	Coho	
	Winter Steel-head	stable
Applegate River Drainage (Area inside SYU	Fall chinook	stable
	Coho	decreasing
	Summer steelhead	decreasing
	Winter steelhead	decreasing

* closed to angling by Oregon Department of Fish & Wildlife due to stream's importance as spawning bed, etc.

Reliable estimates on the catch of resident trout are not available, although it is certain that several thousands are caught each year. Rainbow respond well to rearing under hatchery conditions, as a consequence large numbers (approx. 93,000) of them are annually stocked into the Rogue drainage by the State Department of Fish and Wildlife. Rainbow exceed all other trout in returns to the angler. Approximately two-thirds of the annual trout harvest is attributed to rainbow or juvenile steelhead. Based on estimates by the Oregon Department of Fish and Wildlife, approximately 50,000 trout are caught by sport fishermen annually from waters within the unit. Trout populations are considered stable in all waters in the unit except for Applegate River Drainage.

Warm Water Game Fishes

Populations of largemouth bass, bluegill, pumpkinseed sunfish, green sunfish, brown bullhead and black crappie are restricted to sloughs and reservoirs within the Josephine unit. None of these species is indigenous to western Oregon; all have been introduced as game fish. Whereas trout and salmon prefer cold, fast-moving waters, warm water species prefer quiet, warm waters. Neither group can thrive in the other's habitat. Areas such as dredge ponds or river sloughs resulting from old mine or gravel operations provide the main source of habitat for warm water fishes on public lands within the unit. These species have not increased their abundance significantly because suitable habitat is limited.

Warm water game fish receive heavy angling pressure at Selmac Lake (approximately 20,000 angler days per year). No data is available on the annual catch. A few private ponds and river sloughs in the area have good populations but angler use is not known.

Non-Game Fishes

Nearly all moderate or low elevation streams in the unit support non-game fish. Redside shiners, suckers, and carp are particularly abundant. Many non-game species are important as scavengers of stream detritus, aquatic plants or invertebrates. Some non-game fishes are fed upon by game fishes. Therefore, moderate populations of non-game native fishes are important to the acquatic ecosystem.

Stream alternations such as water withdrawals and removal of riparian vegetation have created conditions favoring the survival of non-game species over cold water game species. Chemical rehabilitation of streams and re-stocking with game fish has been partially effective in temporarily reducing non-game fish populations.

Invertebrates

The invertebrates are the predominant group of animals in the SYU. Indeed, worldwide, they far surpass the vertebrate animals in species diversity and number of individuals, in both terrestrial and aquatic

ecosystems. More than 90 per cent of all known animals are invertebrates; at least 75 per cent of these invertebrates belong to the phylum Arthropoda (Hickman, 1967). The Arthropods are jointed-legged invertebrates, a category that includes insects.

Invertebrates, especially insects, are important in the Josephine SYU because they are economic pests of forest and agricultural crops and products and because of their status within terrestrial and aquatic food webs. They are also of obvious importance as physical annoyances to man and livestock.

In spite of their recognized abundance and ecologic significance, little information is available on invertebrate populations indigenous to the SYU. For this reason the following general discussion will be limited to the major invertebrate groups suspected to occur in the area and for which ecologic interrelationships have been documented in other geographic areas.

Terrestrial Invertebrates

Some type of invertebrate fauna occupies all available niches from below the soil surface to the tops of the forest canopy.

Stratification of the Forest Invertebrate Community.

Lower Strata. Soil invertebrates comprise two basic groups: Those which spend their entire life cycle in the soil (geobionts) and those

which live there for portions of their life cycles (geophils). Members of the former group include protozoans (microscopic), nematodes (mostly microscopic) and annelid worms such as earthworms and potworms. Geophils are mainly insects such as flies and grasshoppers (some of which may live in the soil as eggs, larvae or pupae), moths (which may live in the soil as cocoons) and beetles and true bugs (many of which hibernate in the soil).

Non-Arthropods, such as nematodes and earthworms, are the most numerous invertebrates in soil, while arthropods are more abundant above the soil, especially in the litter/duff layer on the forest floor. Table 2.1.2-14, modified from (Reichle, 1969) shows the general groups of small invertebrates and their feeding habits in forest litter and soil.

The undersides of stones and rotten logs provide special microhabitat for a variety of invertebrates including snails and slugs, centipedes, millipedes, springtails, earwigs and certain beetles. Many common soil animals are also found in special tree hole forest microhabitat (Kendeigh, 1961).

Upper Strata. The air space and vegetation above the soil may be considered the upper strata available to terrestrial invertebrates. The majority of upper strata invertebrates are Arthropods. Many of these animals feed on living plant materials, both foliage and stems, while others are predaceous, parasitic or scavenging.

TABLE 2.1.2-14

General Grouping of Forest Litter and Soil Invertebrates and their Food Habitats. Data modified from Reichle, 1969.

Forest Invertebrate group	Feeding Habit: predaceous	carrion	dung	wood	fungus	decaying matter	live plants
earthworms						X	
potworms					X	X	
snails						X	X
nematodes	X	X		X			X
millipedes						X	X
centipedes	X						
sawbugs		X	X		X	X	X
ticks & mites	X	X	X	X	X	X	X
spiders	X						
harvestmen	X	X	X		X		X
Springtails		X			X	X	X
grasshoppers		X			X	X	X
roaches		X			X	X	X
termites				X	X	X	
true bugs	X						X
cicadas							X
beetles	X	X	X	X	X	X	X
flies & midges*	X	X	X			X	X
ichneuman wasps*	X						
ants	X	X			X		X

* both larvae and/or adults

A common upper stratum invertebrate community such as may be expected to occur in the SYU would include representative spiders, ants, wasps, flies, beetles, leafhoppers and true bugs. Population levels depend upon the amount of green foliage present (Kendeigh, 1961). Such insects as barklice (Psocopterans) would be found scavenging over the bark of trees. Table 2.1.2-15, modified from Fichter (1939), presents invertebrate data collected from a spruce-fir forest in Wyoming. A similar representation of Arthropods could be expected in the SYU, although the numbers of genera would probably differ.

<u>Forest Pests of Economic Significance</u>. Numerous insects attack coniferous forests. The pine beetles, Douglas-fir beetle, borers and engravers attack the inner bark and cambium of conifers. Aphids and true bugs (order Hemiptera) have mouth parts which allow the insects to puncture leaves and suck plant juices. Sucking insects are important as carriers of tree viruses and other diseases. Tussock moths, case-bearers, budworms, leaf beetles and sawflies are among the numerous species known as defoliators of forest trees.

Most of these insects maintain low level residual populations which are always present in the SYU. Occasionally, however, environmental conditions are conducive to major population increases (outbreaks). It is during these outbreaks that insect damage can become widespread and of major economic significance. For this reason the U.S. Forest Service

TABLE 2.1.2-15

Arthropods Collected in Various Strata within a Spruce-fir forest in Wyoming. Data from Fichter, 1936.

Invertebrate Group	Number of genera by forest stratum		
	Herb-Half Shrub	Undergrowth	low tree
ARACHNIDA			
Spiders (Araneida)	4	7	8
ticks & mites (Acarina)	7	6	5
INSECTA			
Springtails (Collembola)	3	2	1
Barklice (Psocoptera)		1	1
Stoneflies (Plecoptera)			1
Cicadas, aphids, scales, etc. (Homoptera)	4	4	4
True bugs (Hemiptera)	2	3	4
Caddisflies (Trichoptera)		1	1
Moths, butterflies (Lepidoptera)	3	3	2
Beetles (Coleoptera)	3	3	4
Flies (Diptera)	25	18	17
Wasps, ants, bees (Hymenoptera)	10	6	7
	61	54	55

TABLE 2.1.2-16

Summary of Known Insect Outbreaks in 1976. Josephine Sustained Yield Unit. Data Compiled from USFS, Forest Insect Survey Maps.

Insect	Host Trees	Number of Outbreaks
Douglas-fir beetle	Douglas-fir	19
Fir Engraver	True firs	3
Mountain Pine Beetle	Ponderosa Pine	9
	Sugar Pine	16
	Western White Pine	1
Western Pine Beetle	Ponderosa Pine	10
Flathead Wood Borer	Douglas-fir	18
	Ponderosa Pine	2
Knobcone Pine Sawfly	Knobcone Pine	3
		81

undertakes regular surveys to determine insect damage on all forest lands (both private and public) in the United States.

The two most common control methods are insecticide sprays and salvage logging. Aerial spraying is generally most practicable when large areas must be treated. Salvaging removes damaged trees to prevent eggs deposited in dying trees from hatching and contributing to further outbreaks.

Aerial reconnaisance by the Forest Service in 1976 showed 81 minor insect outbreaks in the SYU, involving six species. Most of the outbreaks affected fewer than ten trees each. Table 2.1.2-16 tabulates the 81 outbreaks by insect species and host tree.

Aquatic Invertebrates

Most of the waters within the Josephine SYU provide habitat for large numbers of invertebrates. Insects are probably dominant although various rotifers, nematodes, crustaceans and helminths may be locally more numerous.

Habitat Types

Aquatic environments may conveniently be lumped into two major categories: standing (lentic) waters and running (lotic) waters. Lentic environments include lakes, ponds, swamps and bogs. Lotic

environments include springs, streams and rivers. Physical differences in current, oxygen tension and land/water interchange are responsible for faunal differences between the two environments. Lotic environments, for example, have more invertebrates which attach themselves to the undersides of stones, etc., while lotic environments have a greater proportion of free-swimming and bottom-dwelling forms.

Most of the aquatic habitat on public lands within the SYU is lotic and much of it is extremely important to the cold water fishery in the area. Aquatic invertebrates comprise a major portion of the diets of most fishes and are therefore an essential element of the existing environment in the SYU. Although lentic invertebrates are of unquestionable importance within their environment, major lentic habitats do not occur within the SYU. Therefore this section of the ES will be limited to lotic environments.

Lotic Macroinvertebrates.

Highly adapted insects are generally the most abundant members of the stream fauna. Many families of mayflies, dragonflies, stoneflies, and long-horned flies (Nematocera) are virtually restricted to lotic environments (Hynes, 1970). Perhaps the most interesting feature of the lotic insect fauna is its nearly world-wide uniformity. The same families and, sometimes, genera may be found in suitable habitat almost anywhere on earth.

Macroinvertebrate (invertebrates which are visible to the eye) data are not available for most of the streams in the SYU. However, some studies have been performed on the Upper Rogue River (Walsh, 1973) and the South Umpqua Basin (Stansbury, 1976) which should be representative of conditions within the SYU. As shown in Table 2.1.2-17 diversity is relatively high and indicative of clean water conditions.

Ecologic Interrelationships. Although most of the invertebrates in the Josephine SYU are small and inconspicuous they exert a major force in the terrestrial and aquatic ecosystems.

Terrestrial

Soil invertebrates are extremely active in the breakdown of organic matter and the aeration of soil. Scavenging invertebrates assist in the conversion of decomposing plant and animal materials into simpler substances more easily utilized by plants. Therefore, invertebrates contribute significantly to the fertility of forest soils and ultimately to the composition of the forest and the vitality of the trees. Kendeigh (1961) reports that the earthworms Lumbricus terrestris and Allolobophora caliginosa, introduced by fishermen along some forest rivers in certain areas, have altered the characteristics of soils to the jeopardy of the entire original forest community. It is not known if these earthworms occur in the SYU.

Parasitic and predatory insects are important agents in the control of populations of pest insects. According to Borror and Delong (1964), "probably nothing that man can do in controlling insects by other methods will compare with the control exerted by...(insect-eating animals)." Many of these attack beneficial insects as well as pests. Some predatory or parasitic insects known or assumed to occur in the SYU include:

Predator	Prey
Dragonflies & damselflies	Mosquitoes
Ground beetles	Various
Tiger beetles	Various
Ladybird beetles	Aphids
Vespid and sphecid wasps	Caterpillars, grasshoppers, aphids
Lacewings	Aphids
True bugs	Caterpillars
Robber flies, syrphid flies	Various

Invertebrates are extremely important in terrestrial food webs. Many vertebrate animals are dependent on invertebrates as a food source. Toads, frogs, lizards, moles, skunks, shrews and bats feed preferentially or entirely an invertebrates. Many species of birds are completely insectivorous while others rely on invertebrates to furnish a high protein diet to their nestlings. Some of the more common insectivorous

TABLE 2.1.2-17

Major Aquatic Insect Groups of Known Occurrence in the Upper Rogue River and the South Umpqua Basin.

Order	Number of Families South Umpqua Basin	Upper Rogue River**
*Ephemeroptera (Mayflies)	8	3
*Plecoptera (Stoneflies)	8	5
Odonata (Dragonflies)	6	1
Trichoptera (Caddisflies)	16	3
Hemiptera (True bugs)	6	1
Coleoptera (Beetles)	7	3
Diptera (flies, mosquitoes midges)	19	4
Megaloptera (Dobsonflies)	2	0
Lepidoptera (Moths, butterflies)	1	1

* Considered indicative of clean water.

** Benthic forms only

Sources: Stansbury, 1976; Walsh, 1973.

birds in the SYU include the common nighthawk, pileated woodpecker, hairy woodpecker, violet-green swallow, white-breasted nuthatch, orange-crowned warbler, Wilson's warbler and rock wren. Many raptorial birds will prey upon insectivorous animals.

Defoliators and other plant-feeding invertebrates are as ecologically significant in the control of noxious weeds as they are in the destruction of timber trees. Just as forest pests can change forest composition to man's detriment, they can also help to control the undesirable vegetation.

Tansy ragwort, a toxic weed, was introduced from Europe to the Pacific Northwest in about 1922. It is now a common invader plant on cutover forests, especially in the Coast Range. The cinnabar moth, larvae of which feed wholly on the foliage of tansy ragwort, was introduced from Europe in 1960 as a possible control agent for the weed. Preliminary results indicate that the moth may be of value in controlling the weed, especially in remote areas where other control methods are ineffective. Other insects known to feed on Tansy ragwort are larval seed flies (Hylemya seneciella) and adult and larval flea beetles (Longitarsus jacobaeae).

Wood borers and pine beetles are ecologically significant because their regular population outbreaks kill trees that later become nesting and denning habitat for a variety of vertebrates. Woodpeckers such as the northern three-toed, downy and hairy, consume large numbers of these

insects during outbreaks and may later utilize the insect-killed trees for nesting cavities. Species such as the racoon and northern spotted owl may use the cavity after woodpeckers have abandoned it. When the dead tree finally decays and falls, it is returned to the soil as nutrients through the action of soil and litter invertebrates.

Aquatic

The primary food source for most lotic invertebrates is plant debris. Without invertebrates, most bodies of water would become "cesspools" of organic water. Although lotic environments may produce vegetation, Hynes (1970) reports that terrestrial vegetation may be the most important source of energy for stream fauna. Therefore the productivity of a valley is more important to stream fauna than the primary production of the stream itself, which may, because of shading, be very low (Hynes, 1970). In addition to vegetation many invertebrates may feed on plankton, detritus and other invertebrates.

Invertebrates are very important in the diets of most fishes. Chapman (1961) reported that approximately 99 per cent of the diet of coho salmon in Deer Creek (Alsea River drainage) was invertebrates. Approximately 43 per cent of those invertebrates were dipterans (fly, mosquito and midge larvae) while mayflies, annelid worms, caddis flies, stoneflies and various beetles constituted the major portion of the remainder of coho diet.

Dimick and Moto (1934) found that insects formed about 96 per cent of the diet of rainbow trout in Oregon streams. Mayflies were the major food item. Lowry (1966) reported that cutthroat trout in Oregon coastal streams received about 46 per cent of their diet from aquatic and terrestrial invertebrates.

Social Environment

Within this section are grouped categories of data descriptive of human behavior including the social, cultural, and economic aspects. This is the "people" discussion of Josephine SYU, as opposed to the non-living physical and non-human biological data previously displayed.

Social environment in the present context may be contrasted with the final section on existing land use. Both represent obvious evidence of man's action on, and interaction with, the environment. Social environment as defined here gives strong consideration to man's sensitivities. Land use is a discussion of use allocations applicable to limited land resources.

Recreation

The Josephine SYU is located in a portion of southwest Oregon which is noted for its natural beauty and physical attributes conducive to recreation of local, State, and national reputation. Within the unit or near it are Oregon Caves National Monument, Crater Lake National Park, Kalmiopsis Wilderness Area, and the Rogue National Wild and Scenic River, one of the eight initial components of the National Wild and Scenic River System included at the passage of the Act in 1968. The Illinois River is a State Scenic Waterway and has been recommended in part for inclusion into the National River System (Figure 2.1.3-1).

The availability of recreation amenities has made the region a desirable one in which to live and resulted in tourism being an important facet of the economy.

Figure 2.1.3-1 Fig 1

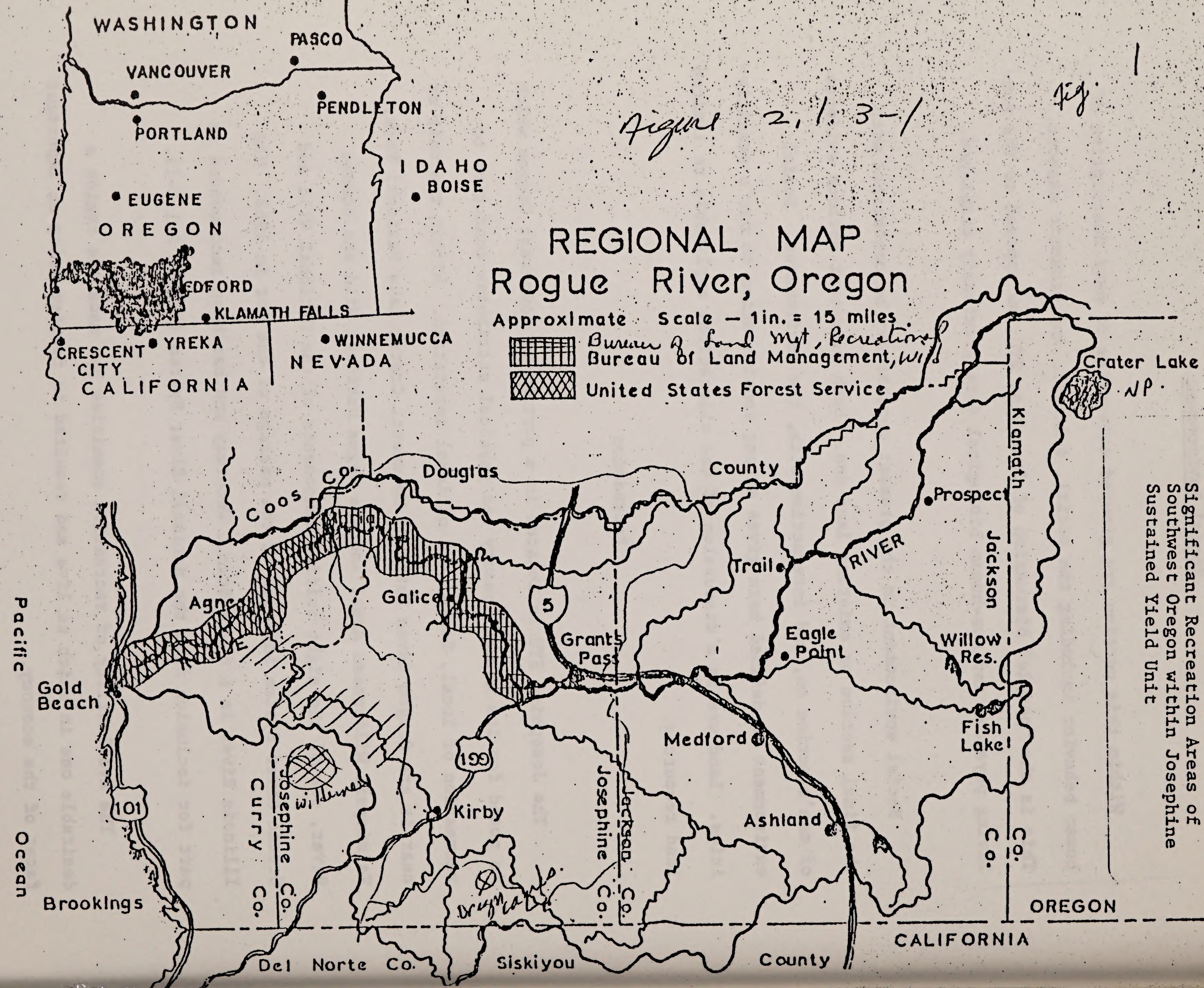

FIGURE 2.1.3-1: Nationally Significant Recreation Areas of Southwest Oregon within Josephine Sustained Yield Unit

Recreation Within the Josephine Sustained Yield Unit

Most of the Josephine SYU is within the Rogue River Basin, which is widely known for the variety and quality of its recreation resources. The Rogue River has become increasingly popular for fishing, boating, hiking and enjoying natural beauty. The surrounding Klamath Mountains provide a rugged, scenic area for hunting, hiking, camping, sightseeing, picnicking and riding off-road vehicles (ORV's). Public participation in the gamut of recreation activities has resulted in many kinds of facilities and services for the comfort and convenience of tourists and recreationists.

Within the SYU are located 31 of the 33 parks composing the Josephine County park system, as well as two Douglas County parks. Illinois River Forks State Park and the Rough and Ready State Wayside are also within the SYU. Seven of the county parks and the State park are on public lands, leased from BLM under provision of the Recreation and Public Purposes Act of 1926 (R&PP), as amended. Two county parks and the Rough and Ready State Wayside are under R&PP patents with reversionary clauses. BLM administers four campgrounds within the JSYU in addition to facilities associated with management of the Rogue Wild River. Figure 2.1.3-2 shows the location of all public recreation sites throughout the unit. Private interests provide overnight lodging, eating facilities and guided boat rides on the Rogue River. One enterprise provides jet boat excursions for tourist groups between Grants Pass and Hellgate Canyon.

Overall use of the river basin is increasing. After a sharp reduction in visitor use during the gasoline-short years of 1973 and 1974, attendance

2.1.3-47

FIGURE 2.1.3-2: Public Recreation Sites within Josephine Sustained Yield Unit

tional Forest, Forest Service

tional Resource Lands, BLM

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Recreation Areas Sites Within Josephine SYU
(Legend)

Bureau of Land Management

1. Rogue Wild Scenic River
2. Tucker Flat Campground
3. Shady Branch Campground
4. Deer Creek Campground

State of Oregon

5. Hellgate Overlook
6. Illinois River Forks State Park (R&PP Lease)
7. Rough and Ready Wayside (R&PP Patent)

Douglas County

8. Windy Creek
9. Whitehorse Park

Josephine County

10. Chinook Park
11. Schroeder Park
12. Lathrop Access
13. Matson
14. Upper Ferry
15. Griffin Park (R&PP Patent)
16. Roberston Ridge
17. Hellgate (R&PP Lease)
18. Indian Mary
19. Almeda Bar
20. Illinois Valley
21. Lake Selmac (R&PP Lease)
22. Fish Hatchery
23. Sucker Creek
24. Irrigation Park
25. Argo Recreation Area (R&PP Lease)
26. Cathedral Hills (R&PP Lease)
27. Graves Creek Access (R&PP Lease)
28. Pierce Riffle
29. Wolf Creek
30. Rand Recreation Area (R&PP Lease)
31. Ennis Riffle (R&PP Patent)
32. Carpenter Island (R&PP Lease)
33. Josephine Co. Sportsman Park
34. Hog Creek Landing
35. Foothill Access
36. Galice Launch Site
37. Reuban Recreation Area (R&PP Lease)
38. Riverside Park
39. Pearce Park
40. White Horse Park

Grants Pass

41. Highland Recreation Area (R&PP Lease)

at Illinois River Forks State Park has again been increasing. This park recorded 123,000 visitor days in FY 1975, an 86 per cent increase over FY 1974 and a 58 per cent increase over the pre-shortage period, FY 1971 (Oregon Department of Transportation, 1976).

Visits to the Josephine County parks within the SYU totaled more than 560,000 in 1975, an increase of more than 10 per cent over 1974. The number of paid campers increased by 12 per cent during the same period (Josephine County Parks, 1975 Attendance Sheet). Josephine County Park Board data also show that approximately 48 per cent of the visitors are from other states, the majority from California. Within the SYU, Josephine County received an estimated 117 million visits (ie., activity occasions) in 1975 (Oregon Department of Transportation, 1976).

Recreation Related to NRL

Varied activities are available to recreationists on public lands within Josephine SYU Much recreation takes place on or near the Rogue River, which is discussed separately.

Overview of the Rogue Wild & Scenic River

An 84-mile segment of the Rogue was designated a component of the National Wild and Scenic River System in 1968. The designated section administered by BLM is entirely within the JSYU, extending from the mouth of the Applegate River downstream approximately 47 river miles to the east boundary of the Siskiyou National Forest near Marial. The

remainder of the Rogue Wild and Scenic River, approximately 37 river miles from the Siskiyou National Forest boundary downstream to the Lobster Creek Bridge, is under the administration of the Forest Service (Figure 2.1.3-1). Both BLM and USFS prepared master plans in 1969 for the river segments administered by each, and a joint plan was prepared in 1972.

The Wild and Scenic Rivers Act provides for the management of a designated river or river segments as wild, scenic, or recreational. Within the BLM section of the Rogue River, two of the three management classifications are utilized. A 27-mile long recreational river area, extending from the mouth of the Applegate River to the Grave Creek Bridge, is managed to provide or restore a wide range of outdoor recreation opportunities on the river. The remaining 20-mile section is classified as a wild river area. It is managed to preserve the river and its immediate environment in a natural, wild, and primitive condition essentially unaltered by the effects of man as well as to provide river-oriented recreation opportunities within a primitive setting.

Approximately 6,400 acres of the Rogue Wild River corridor (the area within ¼ mile on each side of the river) within the SYU have been withdrawn from timber harvest to protect the scenic and recreational values. Management objectives contained in the 1972 master plan also provides for protection of scenery within view of the river or adjacent Rogue River Trail even if the seen area is outside the withdrawal area (37 FR 131: 13415, 1972).

Visitation to the Rogue River has increased substantially since it was included in the National Wild and Scenic Rivers System. The popularity of the river, which is also included in the Oregon Scenic Waterway System, resulted in the need to ration use to protect the values for which the river was included in the National System. Restrictions were implemented in 1973 to limit the number of commercial boating parties. A permit system was adopted by the Oregon Marine Board in 1976 and will be effective in January 1978. It will limit the numbers of both commercial and private boating starts on the wild river to 120 people a day during the summer. This system is designed to spread use evenly throughout the regulated period while reducing weekend and holiday use.

In 1976, 1480 parties (more than 12,000 persons) visited the wild river during the summer and fall. The number of people boating on the wild Rogue during the summer season has doubled from 1973 to 1976 (Table 2.1.3-1). The number of day users at the Grave Creek checkpoint during the summer season has grown from 1916 visitors in 1973 to 4639 in 1976, an increase of 142 per cent. However, use at developed sites along the recreational portion of the Rogue has increased very little since 1974. While BLM does not manage any campground or day use recreation areas along this portion of the river, use data from twelve Josephine County parks located along this river segment show an increase from 258,500 visitors in 1974 to 275,500 visitors in 1975, an increase of about 5 per cent. These figures do not include the fishing and picnicking which occurs along non-developed public access areas. Based on average daily traffic (ADT) counts on county roads which provide access to the recreation river, over 4,000 visitor days of sightseeing can be attributed to public lands during 1974.

TABLE 2.1.3-1

Rogue Wild River Boating Use
Summer Season
(Memorial Day-Labor Day)

	1973	1974	1975	1976	Percent Increase (1973-1976)
Commercial Boating					
Parties	255	246	285	311	
People	3,340	3,704	4,000	4,885	48%
Non-Commercial Boating					
Parties	207	277	415	632	
People	1,002	1,736	2,520	3,854	285%
Total Boating					
Parties	462	523	700	94	
People	4,342	4,440	6,520	8,739	101%

Source: Bureau Planning Documents: Rogue Wild River Recreational Use Census.

Sightseeing

General sightseeing results when persons drive through public lands, whether they are specifically visiting public lands or merely passing through. Land administered by BLM provides a backdrop of forested hills where the viewer can observe different forest types and land patterns resulting from timber management and other activities. Often termed driving for pleasure, general sightseeing is primarily associated with travel along established roadways. A primary indicator of general sightseeing participation is road statistics. Based on ADT counts for 1974, over 200,000 visitor days of sightseeing can be attributed to public lands outside the Rogue River corridor.

In addition to general sightseeing, persons utilize public lands for specific sightseeing goals or sightsee in connection with other activities, particularly hiking or stream floating. Various resources on public lands furnish a basis for sightseeing related activities. Figure 2.1.3-3 shows the location of known areas which attract this use.

In the southern portion of the Josephine SYU, numerous caves provide information about geological occurrences and may contain interesting minerals or unusual plant and animal life. Some of these caves can provide a physical challenge or an adventure in exploration as well as sightseeing.

Along the Rogue River at Hellgate Canyon (or Horseshoe Bend) is evidence of erosion-resistant metavolcanic rock which has resulted in unusual shapes and atypical stream channelling.

Pitcher Plants, a protected species, are a sightseeing attraction found at several locations throughout the SYU.

Botanical sightseeing encompasses the viewing of common forest types as well as plants with unusual botanical value. A number of unusual and possibly rare and endangered plants inhabit the SYU. Threatened and endangered plant species are discussed in Section 2.1.2.2. Places which have unusual botanical value include the Rogue Wild River Area, Hobson Horn, Cedar Mountain, Eight-Dollar Mountain, Rough and Ready State Wayside, Brewer Spruce Research Natural Area, Myrtlewood Grove, and Woodcock Bog. Numerous other sites have been inventoried by the Nature Conservancy; however many of these are not a matter of public record. Serpentine areas occur throughout the SYU and are of interesting botanical value. Specific areas set aside for their botanical value are discussed further in Section 2.1.4.5.

A variety of birds, small animals, deer and bear may occasionally be seen from roads or rivers. An area within the Rogue Wild River Corridor near the Rogue River Ranch has been recommended by the Oregon Fish and Game Commission for a wildlife viewing area. Wildlife that can be seen in the vicinity of the ranch include black-tailed deer, black bear, river otter, silver gray squirrel, mountain quail, osprey, great blue herons, bald and golden eagle and the common merganser. These species are visible all along the designated wild river. The Nature Conservancy has inventoried several heron rookeries, two eagle nests and an osprey nest within or adjacent to public lands.

There are several sites of historical interest, three of which are designated in the National Register of Historic Places. A discussion of these sites along with a map and tables can be found in the section on Cultural Resources.

Hunting

Opportunities exist for hunting big game (deer, elk and bear), upland game birds, small game, and to a limited extent, waterfowl. With one exception, all public lands in the SYU are open to hunting. The area one mile on either side of the Rogue River beginning at Grave Creek and extending beyond the Josephine SYU to Lobster Creek is closed to bear hunting. Figure 2.1.3-3 shows locations of major hunting areas.

Hunting for black-tailed deer is the most popular hunting activity in the SYU. Upland game birds are of secondary importance in the number of hunter days expended.

The wildlife hunting resource produced on the public lands is significant and accounts for 18 per cent of the hunter days expended in the four State-administered Big Game Management Units (B.G.M.U) which cover the SYU (see Figure 2.1.2-8). Total hunter days may reflect some overlap because several hunting seasons run concurrently. Harvest figures computed in Table 2.1.3-2 reflect a 7 per cent harvest of the estimated deer population. This harvest is far below the resource production capability. The trend in the number of deer harvested and per cent of hunter success is shown in Table 2.1.3-3. This low hunter success reflects a trend of a declining deer population which has continued since the severe winter of 1968-69 (see Section 2.1.2.3).

Virtually all of the public lands within the SYU provide habitat for some species of wildlife. It is estimated that at least 60 per cent of the hunting effort occurs on public lands due in part to suitability of habitat and limitations on access to private land.

2.1.3-14

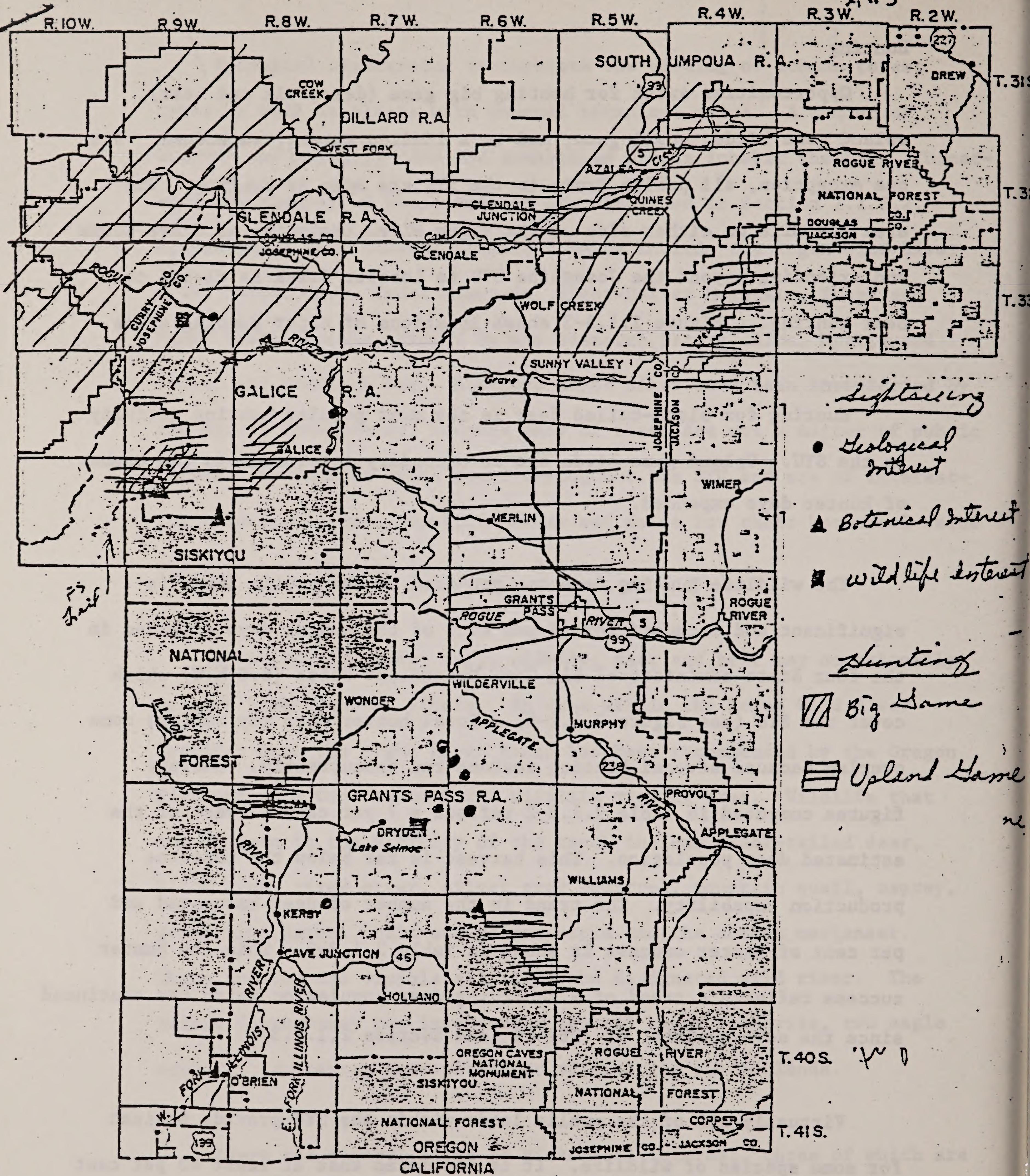

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FIGURE 2.1.3-3: Major Hunting Areas and Sightseeing Attractions.

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TABLE 2.1.3.l-2

Annual Harvest and Hunter Days
Attributable to Public Lands
(yearly average, 1970-1975)

	Number Harvested on Public Lands	Hunter Days on Public Lands
Black Tailed Deer1/	633	14,480
Roosevelt Elk1/	29	1,080
Black Bear1/	26	254
Silver Grey Squirrel1/	896	1,528
Upland Game Birds2/	6,229	5,436
Waterfowl2/	202	271
TOTAL		23,050

1/ Based on per cent of public lands within BGMU
2/ Based on per cent of public lands within Josephine County

Source: Josephine Planning Area Analysis

TABLE 2.1.3.[illegible]-3

Deer Harvest: 1970-1975

Oregon Big Game Mgmt. Unit (BGMU)	Year	Number of Deer Harvested	Hunter Success per cent	Public Lands BGMU	Est. Harvest[1/] on Public Lands
Powers	1970	930	42	24	223
	1971	1,040	57	24	250
	1972	860	34	24	206
	1973	790	27	24	190
	1974	720	20	24	173
	1975	700	23	24	168
Evans Creek	1970	750	37	15	113
	1971	770	46	15	116
	1972	930	41	15	140
	1973	1,450	30	15	218
	1974	1,440	26	15	216
	1975	430	11	15	65
Chetco	1970	1,050	45	7.8	82
	1971	730	31	7.8	57
	1972	1,360	49	7.8	106
	1973	1,670	35	7.8	130
	1974	780	21	7.8	61
	1975	670	20	7.8	52
Applegate	1970	1,490	36	13	194
	1971	1,320	35	13	172
	1972	1,190	29	13	155
	1973	2,570	26	13	334
	1974	2,230	23	13	290
	1975	710	10	13	92

1/ Based on the assumption that deer habitat within each BGMU is homogeneous. Number of deer harvested in each BGMU is then multiplied by per cent public lands within BGMU to give estimated harvest on public lands.

Fishing

Most of the fishing in the SYU is for salmon and trout. The Rogue is internationally known for its outstanding salmon and steelhead trout fisheries. Salmon fishing also occurs below Pomeroy Dam on the Illinois River. The Applegate River, a major tributary to the Rogue, sustains limited fishing but could become an important steelhead fishery with flow augmentations from the proposed Applegate Dam. There are no public lands fronting on this river within JSYU. The Oregon Department of Fish and Wildlife has planted segments of the Applegate River, Rogue River, Sucker Creek and Cow Creek with legal size rainbow trout which provide a "put and take" fishery. In 1976 there were 27,800 angler visits attributable to cold-water fishing on public lands within the JSYU.

While fishing for anadromous species is limited to main stems of the three drainages mentioned, resident trout fishing occurs or could occur on many side streams. None of these streams offers outstanding opportunities: some lack trout in large sizes or quantities, some are inaccessible either physically or legally. Use pressures on all of them are light to moderate, in relation to the opportunities available on the major streams.

A major limitation on fishing opportunities in valley streams is the diversion of water for irrigation purposes. With the annual onset of crop irrigation, some streambeds are nearly dried. Thus only the upper reaches of many side streams support a usable resource. In a dry year, like 1976-77, this situation is exacerbated.

Bass, bluegill, crappie, bullhead, and planted rainbow trout can be caught in Lake Selmac. Since access to the lake is over county land, recreation use is not attributed to public lands. This county-operated, 160-acre recreation reservoir supported 20,000 angler days of fishing in 1975, as reported by the Oregon Fish and Wildlife Department.

Winter Sports

There are few opportunities for winter activities due to topography and weather conditions. Some snow play and snowmobiling does occur, mostly alongside logging roads. Participants in this minor activity are mostly from the local area.

Water Sports

The primary water sport is floatboating on the Rogue Wild River. Twenty miles of the Rogue, from Grave Creek to Marial, is of outstanding quality for this activity. Floatboating on the recreational portion is comparatively low, though both private and commercial parties use it. Power boating, including commercial jet boat tours, occurs on the recreational segment.

Sailboating and swimming take place at the Josephine County facility at Lake Selmac. Unsupervised swimming occurs at Illinois River Forks State Park and along other streams and creeks throughout the SYU. No data are available on the use of public lands for water sports other than floatboating.

Collecting Rocks and Minerals

Opportunities for recreational gold panning may be found at several streams throughout the area. Collecting is known to take place at Grave, Mule, Galice and Coyote Creeks. Collection of agate, Oregon jade (green garnet) and Josephenite is reported to occur within the sustained yield unit. Use estimates are not available.

Motorcycle and Four-Wheel Drive Use

Operating motorcycles and four-wheel drive vehicles on logging roads, jeep trails and skid trails is very popular and accounts for much of the total recreation experience on public lands in the SYU. There are no trails specifically designated for ORV use. Certain areas are popular for hill climbing and general play. These are shown in Figure 2.1.3-4.

Hiking

Prior to construction of the present road system, many fire access trails existed in the JSYU, some of them built in the 1930's by the Civilian Conservation Corps. While the Rogue River Trail is the only hiking trail designated and maintained by BLM within the Josephine SYU, remnants of the old trails can still be identified where undisturbed by road construction or logging. These trails, especially in roadless areas such as those within the Rogue River Canyon, sustain an unknown amount of hiking. Incidental hiking occurs in connection with other activities such as hunting, fishing, rock collecting and sightseeing.

FIGURE 2.1.3-4: Potential Primitive Areas and Popular ORV Locales.

ational Forest, Forest Service

ational Resource Lands, BLM

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Most recorded hiking takes place on the Rogue River Trail, which parallels the Rogue Wild River. Twenty-four miles of the 68-mile trail are maintained by BLM; the remainder is under the jurisdiction of the U.S. Forest Service. The number of visitors using the trail on public lands increased from 809 in 1973 to 1046 in 1976, or about 31 per cent.

Approximately one-half mile of the USFS's Silver Peak-Hobson Horn Trail is on public lands. The location of this trail and the Rogue River Trail is shown on Figure .

Wilderness Values

Primitive Areas. There are no designated primitive areas within the Josephine SYU although the Rogue Wild River Corridor is managed to maintain its primitive values. In addition to the 6,400 acres along the Wild Rogue, approximately 33,800 acres have been identified as meeting broad primitive area criteria. As such, they provide opportunities to renew the spirit, for solitude, a feeling of isolation, and being removed from the impacts and artifacts of human use. Most of this area is in the vicinity of the Rogue Wild River (Figure 2.1.3-4). Portions of these potential primitive areas are too rugged for recreation use but are important for human-intolerant wildlife.

An area of more than 9,000 acres north of the Rogue River has been referred to in Bureau planning documents as the Mule Creek potential primitive area. The rugged terrain has not been conducive to logging

practices, leaving the area uncut. Some evidence of early gold mining exists and jeep trails enter exterior portions of the area. An unmaintained hiking trail provides access to the interior.

A more extensive area traversed by the Rogue River has been identified as the Big Windy-Bunker Creek potential primitive area. This area contains over 24,000 acres, including about 2,700 acres of the Rogue Wild River corridor. While primary visitation is associated with the Rogue River, hunters, hikers, and sightseers recreate throughout the area. Some unimproved trails exist, and one controlled-access jeep road connects Black Bar Lodge on the Rogue with the Galice Access Road to the south. For the most part, primitive values remain intact because the topography is not amenable to development for timber production. The area was heavily burned by wildfire several decades ago.

The Big Windy - Bunker Creek unroaded area may serve as an ecological benchmark in connection with the Research Natural Areas program. Some terrestrial and aquatic cells are still unrepresented in the Siskiyou Mountain Province and may be well exemplified by plant associations within this area (C. T. Dyrness, et al, 1975).

Red Butte is an unroaded, unlogged area of about 2000 acres in the southeast corner of the JSYU. Recreation activity is limited, consisting mainly of ORV use, hiking, hunting, and related sightseeing activities. Adjacent land in the Rogue and Siskiyou National Forests has been inventoried by the Forest Service as "roadless" and is included in the Red Buttes Wilderness Council's proposal for wilderness designation.

Roadless Areas. Under the terms of the Federal Land Policy and Management Act of 1976 (BLM's Organic Act), roadless areas of 5,000 acres or more that have wilderness characteristics are to be reviewed within 15 years. There is a possible conflict between the Organic Act and the O&C Act of 1937. The matter has been referred to Department of Interior's solicitor for an opinion.

Criteria for determination of roadless study areas are more specific than those utilized in the preceding sub-section to identify potential primitive areas. Roadless areas are determined in accordance with the definition contained in House Report 94-1163 which says:

> The word "roadless" refers to the absence of roads which have been improved or maintained by mechnical means to ensure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road.

Based on this definition, there are two areas within the JSYU which are roadless. These are a 8,380 acre tract within the Mule Creek potential primitive area and an 11,860 acre tract within Big Windy - Bunker Creek area now referred to as Zane Gray Roadless Area. These two will require further study to determine whether they quality for wilderness status.

Miscellaneous Dispersed Use

While picnicking occurs throughout the SYU, no designated picnic areas are managed by BLM. Various activities which have recreational

value to some persons are found throughout the SYU. These include collecting firewood, cutting Christmas trees, trapping fur-bearing animals and predator hunting.

Recreation Management Facilities

Only limited visitor management facilities have been provided by BLM within the JSYU. Until recently six sites were maintained for public use in the area. Two, however, were closed due to sanitary problems, limited maintenance funds, and low use rates. Attributes of the remaining four facilities are displayed in Table 2.1.3-4 and their locations are shown on Figure 2.1.3-2.

Use Estimates

According to BLM estimates, public lands received over 334,670 visitor days of use in 1976 (Table 2.1.3-5). This figure does not include recreation use of public lands which is under lease or patent to other public agencies. Since each governmental unit utilizes different methods of accounting visitor use, a summing of county, State, and BLM figures is not practical. Previously cited visitor use data for other recreation jurisdictions within Josephine SYU, (Section 2.1.3.1) give an indication of this additional use.

TABLE 2.1.3-4

Camping Areas Managed by BLM

Within Josephine Sustained Yield Unit

Campground	Camp Sites	Size (Acres)	Water Availability	Toilets
Deer Creek	16	40	well	5 vault
Shady Branch	4	2	well	2 vault
Tucker Flat	8	5	spring	2 vault
Rogue Wild River	10-15	20 miles	stream	16 chemical

Source: Bureau Planning Documents, Recreation Development Inventory

TABLE 2.1.3-5

Estimated Recreation Use on Public Lands, 1976

Activity	Visitor Days (12 hour visitor day)
Rogue Wild River	
Boating 1/	
Overnight 2/	54,540
Day Use	10
Hiking 1/	
Overnight 2/	6,680
Day Use	440
Rogue Recreation River 3/	
Sightseeing	4,100 5/
Motorcycle/ORV/4-wheel	16,300
Camping (non-Rogue River)	9,800 6/
Fishing	12,100
Hunting	4,900
General Sightseeing	217,300 5/
Miscellaneous 4/	8,500
	334,670

1/ Includes 967 visits (485 visitor days) of fishing activity
2/ Overnights at private lodges are included.
3/ Use estimates for dispersed recreation at non-county sites not available.
4/ Includes snow, play, collecting, sightseeing other than general sightseeing (historial, botanical, wildlife, geological), incidental hiking, camping, and picnicking in underdeveloped areas. Estimate is based on professional judgement.
5/ 1974 latest data available
6/ FY 74 latest data available

Source: Medford District, BLM.

Potential Recreation Management Facilities within Josephine SYU

At least 19 sites have been identified as having recreation values for future development. Four sites have potential for facility development such as campgrounds. The remainder have potential for limited development such as fishing access, trails, or picnic areas. Figure 2.1.3-5 shows the approximate location of these sites. It is not known whether any of these sites will be needed in order to manage future recreation use on public lands.

The areas identified under Wilderness Values may qualify as wilderness areas.

The U.S. Forest Service has determined that the Illinois River from the Siskiyou National Forest boundary at Eight Dollar Mountain upstream to the California State line qualifies for recreational status under the criteria established for wild and scenic rivers but has recommended that this portion of the river not be included in the National System. BLM administers 6.5 per cent (1,780 acres) within one-quarter mile of this river segment as part of the Josephine SYU (U.S. Forest Service, 1977).

Potential Recreation Management Facilities

Facility - Related Recreation Values

1. Indian Hills
2. French Flat
3. Deer Creek Flat
4. Kerby Demonstration Site

Limited-Facility Recreation Values

5. Takilma
6. Logan Cut
7. Cave Junction #2
8. West Side Illinois
9. Kerby
10. Anderson
11. Wonder
12. Manzanita
13. Jumpoff Joe
14. Hobson Horn
15. Clark Creek
16. Cow Creek
17. Coleman Creek
18. Quines Creek
19. White Horse

General

The term "cultural resources" as used in this statement primarily refers to remains of human activity. However, since fossils which are of historic, scientific, and unusual interest are protected by the Antiquities Act of 1906, this category is included in this section. Structures, artifacts, works of art, irrigation systems, architecture, historical documents, and locations where historical events took place are only suggestive of the broad range of objects and sites that are considered to be cultural resources.

Federal agencies have been charged with responsibility for the cultural resources on lands under their jurisdiction. Through a group of laws beginning with the Antiquities Act, BLM has been authorized to identify, protect and enhance such resources on public lands. The following procedures were used to identify the cultural resources within the Josephine SYU.

1. The State Historic Preservation Office was asked to identify:
   a. Sites within the area that are on the National Register,
   b. Sites that are known in that office as being eligible for nomination to the National Register.

2. The pertinent literature, both published and unpublished, was consulted.

3. Knowledgeable persons from within and outside the area were asked for information.

4. The Medford District Cultural Resources Specialist provided the information that he has acquired through project clearance and general reconnaisance of the area.

5. The most recent listing of the National Register of Historic places (date) was consulted.

The topography and dense forest covering most of the area make an on-the-ground sample survey of cultural resources almost totally ineffective.

The criteria used to assess the eligibility of identified cultural resources for inclusion in the National Register of Historical Places are described in 36 CFR 800.10. BLM employs a Cultural Resources Evaluation System (CRES) to stratify the relative value of an archeological or historical site. Significance ratings from S-1 (National Register nomination quality) to S-4 (no physical remains) are assigned to each identified cultural resource. A CRES rating is not static. Periodic review, in light of new information, assures continuation of adequate evaluation.

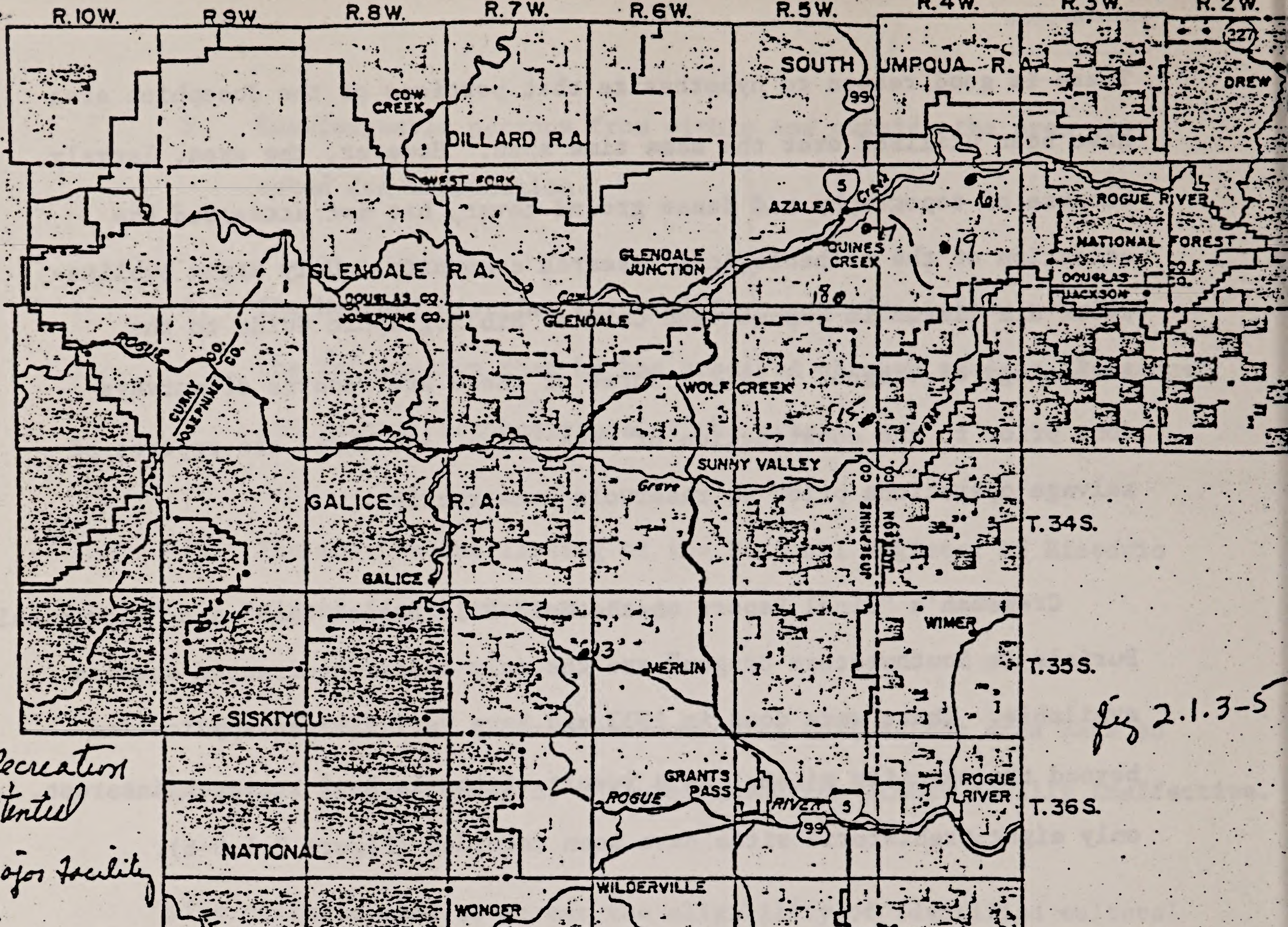
Before Contact with Whites

It is a well-documented fact that at least some areas in Oregon have been occupied by aboriginal populations for at least 12,000 years.

There is good reason to hypothesize that portions of the Josephine area have been utilized over the same time span. However, the area, largely because of topography and dense ground cover, has not attracted the attention of the archeological research community. Only eight publications are listed in Johnson and Cole's "Bibliographic Guide to the Archeology of Oregon" - 1972. Three of these are reports of surveys done prior to the construction of reservoirs, and three are reports of salvage operations prior to reservoir construction.

Cressman's "Final Report on the Gold Hill Burial Site" and "Aboriginal Burials in Southwestern Oregon" are the only research-directed studies available. These were done in 1933 and have very limited application beyond the specific sites. As a result of the lack of research interest, only eight prehistoric sites have been recorded (Figure 2.1.3-6).

While the prehistory of the area has been largely ignored, there has been some work by ethnologists on the life-styles of the inhabitants during the time just prior to White contact. Essentially the entire area within the Josephine SYU was occupied by Takelma (or Dagelma) Indians. The Takelma language is not related to the language of any group in the surrounding area. Estimates of total population do not exceed 500, divided into the Lowland and the Upland groups. Both groups were semi-sedentary and spent a considerable part of each year in small villages of perhaps 50 to 150 people. The Takelma were hunters and gatherers, although the bulk of the caloric intake came from vegetable rather than animal foods. Considerable use was made of salmon, freshwater mussels, and crayfish. Extensive forest burning was practiced with the



Recreation Potential

major facility
▲
Limited facility
●

fig 2.1.3-5

FIGURE 2.1.3-5: Potential Recreation Management Facilities.

National Forest, Forest Service

Public Lands, BLM

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National Forest, Forest Service
National Resource Lands, BLM

FIGURE 2.1.3-6: Archaeological and Historical Sites within the Josephine Sustained Yield Unit.

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Figure 2.1.3-6
Archeological and Historical Sites
(Legend)

Archeological Sites

1. Hellgate Site
2. MNH 35 do-15
3. Jackass Prairie
4. 35-AR-11-42
5. 35-AR-11-43
6. 35-AR-11-44
7. 35-AR-11-45

Historical Sites

1. Rogue River Ranch
2. Whiskey Creek
3. Wolf Creek Inn
4. Allen Town
5. Allen Cemetery
6. Benton Mine
7. Browntown
8. California & Oregon Coast Railroad
9. Galice & Old Channel Mine
10. Fort Lamerick
11. Waldo Townsite
12. Waldo Cemetery
13. Golden
14. Tuller Graves
15. Grave Creek Bridge
16. Kerby Museum
17. Mt. Peavine Lookout
18. Waldo Lookout
19. Hansen Mine
20. Sutherland Brick Works
21. Cohen Mine
22. Zane Gray Cabin

result that the vegetation in the valley area at the time of white contact was not what it would have been without human occupation. Much use was made of basketry. Crudely fashioned, fired pots and small figurines were made. Pit-houses were built of split pine boards with gable roofs. The principal weapon was the sinew-backed yew wood bow.

The Takelma in general and the Upland Takelma in particular had a reputation for ferocity, making frequent raids upon other Indian tribes for slaves. They also resisted white intrusion. So hostile and troublesome were the native peoples that French fur trappers referred to them as "rogues". Thus the Rogue River and the Rogue River Indians became known to white newcomers.

While there may be some individuals who can claim biological descent from the Takelma, the group has long since vanished as a linguistic and cultural entity. Preliminary linguistic and ethnographic analyses tend to show that the Takelma had occupied the area for several hundred years.

CRES rating criteria for archeological resources include depth of site, architectural features, artistic features, size of site, age of antiquity, length of occupation, uniqueness of the site, representativeness, and condition. Application of CRES to the few pre-contact sites identified in the statement area results in data displayed in Table 2.1.3-6.

Table 2.1.3-6

Archeological Sites Within the Josephine SYU

Archeological Sites	Attributes/Condition	Significance/ Rating	Jurisdiction
McCaleb Ranch	Indian burials and artifacts. Private owner allows no investigation	S-1	Private
Hellgate Site (recorded)	Surface scatter of lithic debris. Vandalized	S-3	BLM
MNH 35 DO-15	Surface scatter of obsidian flakes	S-3	BLM
Jackass Prairie	Area of springs and young timber; may have been on Indian hunting site	S-3	BLM
35-AR-11-42	Lithic scatter - very recently identified	S-2	BLM
35-AR-11-43	" " " " "	S-2	BLM
35-AR-11-44	" " " " "	S-2	BLM
35-AR-11-45	" " " " "	S-2	BLM

Note: CRES ratings S-1 to S-4 for archeological resources are defined as follows:

S-1. National Register Significance. In general, S-1 properties show a clear potential for yielding, or have yielded, highly significant scientific/educational information and are clearly important in terms of national, State, or local prehistory.

S-2. Mid-Significance. S-2 properties are usually not particularly unique, representative, nor do they have important associations. The condition of the property usually is only fair. These kinds of properties are often large but do not have great antiquity and only limited depth potential.

S-3. Low Significance. The S-3 rating is assigned if the main worth of the property is its potential for contributing data in regards to solving larger problems, such as reconstruction of paleo-environments and areal human usage patterns. These kinds of properties usually show little if any depth, no or very few features, may have great antiquity but be very small, or may be very large but show no great antiquity or concentration of materials.

S-4. Data Property. The S-4 rating is assigned only to properties that have been totally destroyed.

Post White Contact

The inland areas of southwestern Oregon were first penetrated by Europeans in the mid-1820's when the Hudson Bay Company began sending fur brigades from Fort Vancouver southward to trap the valleys. The Americans, most notably Ewing Young, began to enter the area in the 1830s. Young went to San Francisco where he purchased 750 head of cattle which he drove north more or less along the present route of Interstate 5 to the Willamette settlements in 1837. Thus by the late 1840's a fairly well travelled route had been established between the rapidly growing settlements of the Willamette Valley and the San Francisco area. The traffic swelled in 1846 when the Applegate trail was established across the Black Rock Desert of Nevada and the mountains between Lake Klamath and the Rouge River Valley, linking up with the already established north-south route. Unfortunately, there are few if any identifiable remains from this era.

After the initial gold discoveries in California in 1848, new strikes were made at Galice and Jacksonville in 1851 and on the Illinois River in 1852. Hordes of fortune seekers soon established thriving settlements at Jacksonville, Waldo, Allentown, and Browntown. The miners were followed by farmers who took up arable lands along the Rogue and other interior valleys. Lumbering, for local use only, also began during this period. Inevitably this population growth was to lead to hostilities with the aboriginal inhabitants. There were numerous outbreaks of violence and hostility on both sides which culminated in the defeat of the Indians in the spring and early summer of 1856. In June of 1856 all of the Indians in the area were removed to the Siletz reservation in northwestern Oregon.

Extant physical remains of this period are few. The early mining centers of Waldo, Allentown, and Browntown are gone, and there is little to mark the battlefields and encampments of the Indian wars.

By 1860 nearly all of the good lands in Oregon and elsewhere on the Pacific coast had been settled, the easier gold deposits had been worked, the Indians pacified or removed. The period from 1860 to 1884 has been subject to little historical research or interpretation, it appears that the entire area settled into a relatively prosperous broad spectrum agriculture. While mining declined during the 1860's, gold was one of the major export items as an exchange for goods not produced locally. During the 1870's and 1880's, less accessible gold deposits were worked and Chinese immigrants reworked some of the old areas. Old Channel Hydraulic Mine, located on a "high level" gravel terrace paralleling Galice Creek and the Rogue, was at its peak during this period. In the mid-1880's hard rock or quartz mining activity increased.

Major routes of travel continued to be the old north-south route and the route to the coast and Crescent City which followed the present route of U.S. 199. Very few remains of the period have been documented.

Construction of the Oregon and California Railroad (which became the Southern Pacific in 1888) from Portland to the San Francisco Bay area began in 1868. Trains were running as far south as Eugene by the following year. Thereafter, financial and technical difficulties mounted and the line did not reach the Rogue Valley until 1884. The major effect of the railroad, when it was finally completed, was to tie

the local economy to the national. The advent of rail service initiated shifts in population, reflected in the movement of the county seat from Kerby to Grant's Pass in 1886. Specialty agriculture developed in order to compete in markets outside the valley. Mining activity continued strong. By 1905 the Almeda mine on the north bank of the Rogue was being developed and a smelter was built in 1908. The ore deposit on which this mine was located was especially valuable for copper, but also contained silver, lead and zinc. This mine had more than a mile of underground tunnels, one of which ran under the Rogue. (Winchell, 1914)

A lack of rail lines into the western portions of the county hampered the growth of agriculture and the timber industry. In 1911 construction was begun on the California and Oregon Coast Railroad from Grants Pass to the coast. However the railroad was only completed to a point about 10 miles southwest of the city. Other than mining areas, there are few inventoried sites from this period.

The present era has brought extensive changes to the area both physically and socially. Logging on a commercial scale is a recent arrival and the elements of pre-mechanized logging which add to the history of other parts of the nation are not really a part of local tradition. Mining is on the decline and much of the remain[illegible] past life styles have been obliterated.

Table 2.1.3-7 lists the identified historical sites that might be impacted by some identified aspect of the proposed action. The general location of these sites is shown in Figure 2.1.3.6. The table reflects the present state of knowledge; undoubtedly other sites will be added to the list as they are recognized as having significant historical interest. Historical sites are protected by the same stipulations as archeological sites, and a thorough survey to identify them so they can be protected must be accomplished before any ground-disturbing or title-alienating activity can be undertaken.

Paleontology

Fossils are an important and nonrenewable resource. Vertebrate and certain invertebrate fossils are protected within the scope of the Antiquities Act. While the JSYU has not been thoroughly surveyed, vertebrate invertebrate, and plant fossils are known to occur. These include fossil leaves and mollusca casts in the Umqua formation; fragments of Sequoia in the Colestine formation; leaf prints in the chalky, white tuff of the Wasson formation; and fossils of mastodon, elephant, bison, and horse in Quarternary bench fossils. The latter are probably most prevelant on interglacial deposits. (USGS Medford Quadrangle, 1956)

None of the above described materials are of remarkable interest; however, all reports of fossil-bearing deposits are required to be checked by qualified personnel to avoid destruction of such resources.

Table 2.1.3-7

Historical Sites Within the Josephine SYU

Historical Sites National Register	Attributes/Condition	Jurisdiction	Significance/rating
Rogue River Ranch	Turn of the century farmstead in good condition	Public	S-1
Whiskey Creek	Miner's cabin built in 1880's. In good condition	Public	S-1
Wolf Creek Inn	An important stop on the early North-South route. Dates from 1856, used as hostelry. Good condition.	State	S-1
Non-National Register			
Allen Town	Almost obliterated: Occupancy trespass	Public	S-3
Allen Cemetery	Good	Public	S-2
Benton Mine	Partial remains of gold mine	Private	S-3
Browntown	Obliterated. Once a mining town. Occupancy trespass	Public	S-4
California & Oregon Coast Railroad	Portions of roadbed remain. Abandoned in 1956.	Multiple	S-4
Galice & Old	Existing resort area & richest hydralic placer mines.	Private	S-1
Fort Lamerick	An encampment used in 1856. No visible remains.	Private	S-4
Waldo Townsite	No remains of town: Monument has been erected by Josephine County Historical Society	Private	S-4
Waldo Cemetery	Some graves identifiable	Public	S-3
Golden	Frame buildings in good condition. Marker erected by Josephine Co. Historical Society.	Private	S-2

Table 2.1.3-7

Non-National Register	Attributes/condition	Jurisdiction	Significance/rating
Tuller Graves	Being researched. Graves inadvertently destroyed during road construction prior to BLM jurisdiction	NRL	S-4
Grave Creek Bridge	Covered bridge in very good condition	Josephine Co.	S-2
Kerby Museum	Josephine County Museum Includes restored late 19th century home.	Josephine Co.	S-2
Mt. Peavine Lookout	Lookout tower in good condition	NRL	S-2
Waldo Lookout	Lookout tower still in operation	State	S-2
Hansen Mine	Some buildings still standing. Occupany tresspass problem.	NRL	S-3
Sutherland Brick Works	Ruins of brick kiln	Private	S-3
Cohen Mine	Extant mining claim Cabin & mining equipment dates back to 1920 or earlier	Private	S-3
Zane Gray Cabin	Good. Residence of Zane Gray	Private	S-2

CRES ratings S1 to S4 for historical resources are slightly different than those for archeological. Definitions are as follows:

S-1. National Register Significance. In general, S-1 properties show a clear potential for yielding, or have yielded, highly significant scientific/educational information and are clearly important in terms of national, State, or local history. Normally the S-1 rating will be assigned to those properties which are in relatively good condition, and are unique or representative, and/or have important associations.

S-2. Mid-Significance. Assign S-2 rating if resource does not satisfy S-1 requirements. S-2 properties are usually in only fair condition. They are not particularly unique or representative, nor do they have important associations. Many recently abandoned western homesteads, small mining camps, cemeteries, railbeds, roads and trails will fall here.

S-3. Low Significance. Assign the S-3 rating if the main worth of the property is its potential for contributing data in regards to solving larger problems of areal human usage and environment. Properties such as dumps, isolated domestic and non-domestic buildings and materials, small mining operations, will often fall here.

S-4. Data Property. The S-4 rating is only assigned to resources that have no physical remains in the field and/or have lost field integrity.

Source: Bureau Planning Documents

Visual Resources

The landscape of the Klamath Mountain physiographic region, in which the Josephine SYU is located, is predominantly rugged. Although the average elevation of the mountains is about 5000 feet, some peaks in the southern part of the SYU, in the Siskiyou Mountain Range, rise to over 6500 feet. Steep slopes, narrow canyons and broad valleys associated with the Rogue River and Cow Creek watersheds are the natural landforms on which human use occurs and which can be viewed from roads, trails, or rivers.

Characteristic Landscapes

Four different characteristic landscape associations are discernible within Josephine SYU: upland timber, narrow corridors, Rogue River Canyon, and valley bottoms. Figure 2.1.3-7 shows the location of each.

Upland Timber

The upland timber characteristic landscape is the predominant landscape association of the Josephine SYU. Mountains with narrow ridgelines, very steep slopes and many incised canyons are dominant features. Surface texture, however, is very even; rock outcrops are apparent only in the river canyons or along ridge tops.

FIGURE 2.1.3-7: Characteristic Landscapes

ational Forest, Forest Service

ational Resource Lands, BLM

MILES 10 5 0 10 20

Soils are colored light tan to red and are highly reflective of light when disturbed, a fact that makes road construction and cable or tractor logging skid roads contrast sharply with the natural landscape. Forest management activities of clearcutting and shelterwood timber harvesting with associated road systems create strongly contrasting geometric forms and vegetative texture changes that are not harmonious with the natural landscape. (photo)

Vegetation is a mixed conifer forest type of pine and fir with associated hardwoods, primarily oak, madrone, and chinkapin. At the lower elevations conifers are dominant, but large areas of oak and madrone are discernible. The hardwoods create a variety of natural forms not evident at higher elevations within the upland timber landscape and add greater visual variety and interest with different textures and colors. Madrone is an outstanding example with its shaggy, cinnamon-colored bark. At higher elevations vegetation is almost entirely mixed conifer. Hardwoods, while present as scattered trees, are not a visually apparent element of the vegetation. Here there is a noticeable difference in tree heights, branching patterns and foliage colors in light green pines to dark-colored fir trees. (Photo)

Ridgeline roads offer panoramic views of the rugged terrain and valley bottoms. (Photo) Structures are absent or not very noticeable in the upland timber landscape. Fire lookout towers are far away and painted in muted colors.

Narrow Corridors

This characteristic landscape, found as islands within the upland timber landscape, is typified by a narrow valley with a stream of gentle gradient. Alluvial terraces along the stream have been utilized to locate roads for access to upland timber areas or to traverse topographic barriers. (Photo)

In addition to the roadways, this landscape is distinctive because of its rugged, constantly changing features within an enclosed scene. The general presence of water cascading through the canyon bottom becomes a strong feature of both sight and sound. Plentiful water results in a multitude of fine textured shrubs and hardwoods, providing more variation of form and color than can be found within the upland timber landscape.

Structures in this landscape are roadways with related culvert and bridge installations. Culvert pipes or bridges which do not blend with the natural landscape in design or color may create a visual intrusion. Timber harvesting practices in this characteristic landscape have a tendency to create unsightly blockages of logging debris along the creek bottoms.

The recreational portion of the Rogue River from Hellgate to Grave Creek is included in this landscape type. Steep forested slopes and expanses of dark-colored rock enframe the river. Structures include salmon boards which jut from the river bank, recreational homes, and recreation sites with boat launch ramps and associated facilities.

Rogue River Canyon

The Rogue River is the most interesting scenic feature in the Josephine SYU. From the eastern boundary of the SYU to Hellgate, the Rogue is included in the valley bottom characteristic landscape; from Hellgate to Grave Creek Bridge, the river is included in the narrow corridor landscape. The section of the Rogue classified as "wild" has a distinct character of its own.

Beginning at Grave Creek, the Rogue River Canyon can be viewed only from the Rogue River Trail or from the river itself. The scenery becomes spectacular. The landscape is primarily enclosed as the steep canyon walls limit horizontal views. Form and texture are varied, with forested slopes, rock outcrops, and gravel bars. Rock outcrops vary in color, with blacks, greens, and reddish browns predominating. Vegetation varies depending on slope aspect; northfacing slopes tend to be more even-textured with mature conifers, while southfacing slopes are more nubbly with shrubs and oaks interspersed with openings of red-brown earth. The river itself is a focal point and adds to sight and sound with many rapids and waterfalls. Along the river are several historical buildings such as Zane Gray's Cabin, Whiskey Creek Cabin, and Rogue River Ranch. These add to the scene and are not considered to be intrusions.

Valley Bottoms

This characteristic landscape encompasses ancient meander plains and alluvial areas adjacent to significant streams. The association includes not only broad valley floors but rolling hills within and peripheral to the valley. (Photo) Water is present within this landscape but it is not always a dominant feature due to vegetative screening and road placement.

Vegetation is the dominant feature of the valley bottom landscape. Human settlement has resulted in great variety, with crops, irrigated pasture, shrubs, hardwoods and conifers. An interesting mosaic has been created due to different land uses of the various owners. (Photo) This great variety of vegetation creates multitudes of color and textures throughout the seasonal changes of spring, summer and fall.

The valley bottom is predominantly in private ownership or under the control of local and state governments. Structures are commonly present and have a high impact on views in this landscape. Older structures exemplary of early settlement may have great cultural and scenic value. Poorly maintained structures and areas of greater development density may leave a negative impression. (Photo)

Scenic Values

All public lands are assumed to have some scenic value. Some areas are more scenic than others. While esthetics and scenic values are a

matter of personal judgement and individual taste, BLM has devised criteria to evaluate scenic quality (BLM Manual 6310). The parameters are topography, color (of soil, rock, vegetation, etc.), water, vegetation, uniqueness, and absence or presence of intrusions. Variety within these parameters gives an area more scenic value. The presence of water is considered to be very important. All lands within JSYU regardless of ownership (855,985 acres) were rated according to the procedures described in BLM Manual 6310. Figure 2.1.3-8 shows the scenic quality classes.

Highly scenic, distinctive or unique landscape (Class A) has been identified along the Rogue Wild and Scenic River. The high scenic value of this portion of the Rogue was a factor leading to inclusion of the river within the National Wild and Scenic River System. Water hurtling between canyon walls, rock outcrops, rapids, a variety of vegetation along the river, historic sites, and steep, forested hills which are unroaded and unlogged are typical features included in the more than 15,500 acres of Class A scenery. (photographs)

Lands rated "B" are considered to be above average in scenic value. These lands usually incorporate scenic river valleys with more variety than Class "C" valleys or heavily wooded areas with few intrusions. Approximately 146,000 acres within the Josephine SYU have been identified as having above average scenic value. (photos)

FIGURE 2.1.3-8: Scenic Quality Classes

Most of the JSYU (825,725 acres) is classed as "C", which is average scenic quality for the region. If compared with scenery in other physiographic parts of Oregon or the United States, this acreage might draw a higher rating. However, the bulk of the Josephine SYU is usually comparable with non-coastal Western Oregon. Some portions of the SYU are also rated lower because of visual intrusions. Typically, scenic value "C" land has rolling topography, forested slopes, small creeks or streams, visible roads, residential and agricultural areas, and obvious logging operations. (Photos, with captions adding to the discussion).

Distinctive or Unique Scenery ("A")

(1) The Canyon of the Wild Rogue River

(2) Something Else
maybe Zane Gray Cabin Area

(3) Recreational Rogue River
near somewhere

Above Average Scenery ("B")

(4)

Galice Creek at Merlin with Narrow canyon and remains of an old mine.

(3)

Lake Selmac

(6)

Applegate River SE of Grants Pass. Great variety of land use patterns

(7)

Steep, heavily forested slopes, rock out crops and serpentine areas. Presence of roads and logged areas.

Average Scenery; Scenery marred by intrusions ("C")

(8)
Mt. Peavine looking east toward Rogue River and old Channel Mine

(9)
Typical forest with roads every 1000 feet and/or clear cuts

(10)
Wolf Creek to Glendale Interstate 5

Ambient Noise

Ambient noise is the all-encompassing noise within a given environment, representing a composite of sounds from all sources, near and far.

A majority of public land within the SYU is devoted to timber production, and noise levels generated within the forest reflect a composite of characteristic sounds. Wind rustling through leaves, chirping birds and insects, gurgling streams, bellowing elk, and other similar noise sources contribute to ambient noise levels deep in the forest. Although no noise level surveys have been conducted within the SYU, it is probable that maximum ambient levels average 35-40 decibels measured on the A scale (dBA). This range is in the faint to moderate level of human audibility (AMF, 1971).

Human intrusion into an environment generally brings about an increase in noise. The increase is more dramatic if motor vehicles are involved. For example, a diesel truck may generate 80-90 dBA, audible for 50 feet from the roadway (EPA, unpublished document). An off-road recreation vehicle may generate noise levels that approach those of the diesel truck, depending on the type of muffler used, size of engine and the speed of the vehicle.

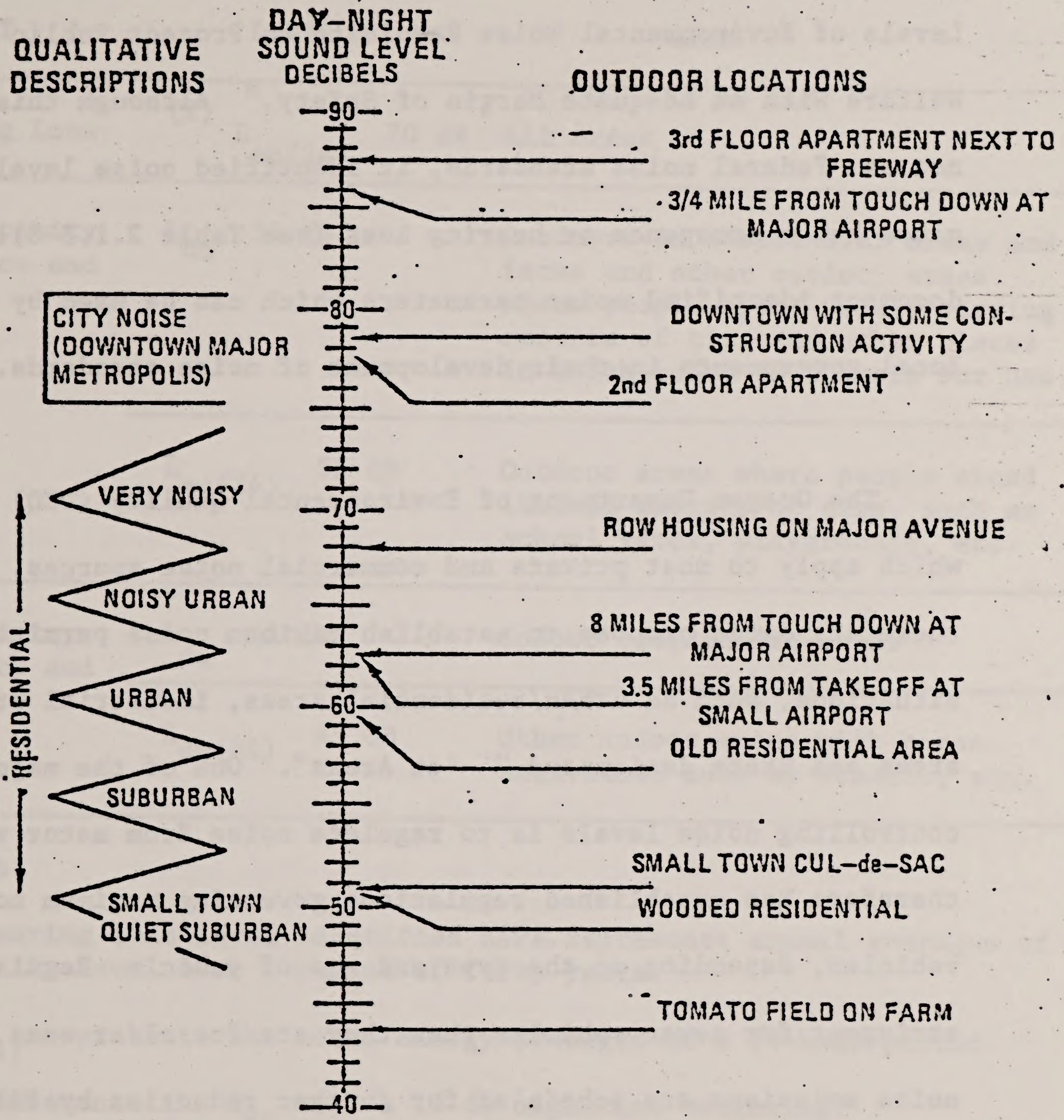
Logging activities are noisy, as are the supportive construction efforts. Chain saws can be heard for great distances. Logging operations and road construction are temporary noise sources: they contribute to ambient noise levels only for the length of time it takes to build the logging road and harvest timber. Sources of noise generation associated with timber harvest include dozers, skidders, chain saws, yarders, loaders, heavy and light trucks, radio communications and human voices.

Factories, sawmills and other industrial activities are fixed noise sources and contribute to ambient noise levels during hours of operation. Common noise generators associated with industrial sources include cranes, generators, pumps, saws, riveters, planers, drills, etc. Factories may generate noise levels exceeding 80 dBA, very loud to the nearby listener (AMF, 1971).

Common exterior noises in residential areas include barking dogs, crying children, TV or radio broadcasts, lawnmowers, automobile engines and loud conversations. Indoor sounds in a noisy home may approach 50 dBA, a moderate level (AMF, 1971). Exterior noise levels may be lower except for periods of maximum outside neighborhood activity. Figure 2.1.3-9 presents noise data, tabulated by the U.S. Environmental Protection Agency (1974) for various locations and environmental situations in the United States. Similar data are not available site specific for areas within the SYU although it is suspected that studies would reveal a comparable situation.

Figure 2.1.3-8a

Outdoor Day-Night Sound Levels in Decibels at Various Locations in the United States



Source: EPA 1974. Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety. U.S. EPA 550 19-74-004

Applicable Standards

In March 1974 the EPA published a document entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety." Although this document did not set Federal noise standards, it identified noise levels that can cause human annoyance or hearing loss (see Table 2.1.3-8). As such, the document identified noise parameters which can be used by State and local governments in their development of noise standards.

The Oregon Department of Environmental Quality (DEQ) has set standards which apply to most private and commercial noise sources. In general, these standards propose to establish maximum noise permitted in different situations, such as urban/residential areas, industrial or commercial areas and State designated "Quiet Areas". One of the major means for controlling noise levels is to regulate noise from motor vehicles. DEQ therefore has established regulations governing maximum noise for motor vehicles, depending on the type and age of vehicle. Regulations are more stringent for newer vehicles than they are for older ones, and allowable noise emissions are scheduled for further reduction by 1978.

TABLE 2.1.3-8

SUMMARY OF NOISE LEVELS IDENTIFIED BY EPA (1974) AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY

EFFECT	LEVEL		AREA
(1) Hearing Loss	(2) $L_{eq(24)}$	70 dB	All areas
Outdoor activity interference and annoyance	L_{dn}	55 dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quite is a basis for use.
	$L_{eq(24)}$	55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	L_{dn}	45 dB	Indoor residential areas
	$L_{eq(24)}$	45 dB	Other indoor areas with human activities such as schools, etc.

Explanation:

(1) The hearing loss level identified here represents annual averages of the daily level over a period of forty years.

(2) $L_{eq(24)}$ represents the sound energy averages of a 24-hour period.

(3) L_{dn} represents the L_{eq} with a 10 dB nighttime weighting.

NOTE: EPA has determined that for purposes of hearing conservation alone, a level which is protective of that segment of the population at or below the 96th percentile will protect virtually the entire population. This level has been calculated to be an L_{eq} of 70 dB over a 24-hour day.

Source: EPA (1974)

Socio-Economic Conditions

Region to be Described

The following discussion addresses questions which must be answered in order to define the proper region to be described.

Land area and commercial forest area provide an approximate indicator of the relative impact of O&C timber programs upon public revenues among counties. Log destinations and trade regions indicate the likely loci of income, employment, population, and public finance impacts.

Regional Economic Overview

The southwest Oregon region, consisting of Coos, Curry, Douglas, Jackson, and Josephine Counties, has a land area of 8,147,000 acres. Forests cover approximately 7,022,000 acres, of which 87 per cent or 6,129,000 acres are classified as commercial forest land.

This area has a population of about 316,100, 13.5 per cent of the State's total in July of 1976. Major cities include Coos Bay, a seaport for forest products shipping; Roseburg, Grants Pass, the Rogue River tourist center; Medford, near Crater Lake, an important industrial and service center for the Rogue River Valley; and the college town of Ashland, whose Shakespearean festival is a major attraction each summer.

Important industries in southwest Oregon are mining, ranching, farming, tourism, and timber. Communities in the area rely heavily upon the timber industry for employment. The industry provided jobs for approximately 21,000 during 1975 with twenty three percent of these jobs directly associated with the sawmill and veneer and plywood industries.

The southwest Oregon area plays a major role in the local, regional, and national timber supply situation. During 1970-74, the forests in these five counties produced nearly one third of the State's timber harvest. Approximately 5 per cent of the nation's lumber and one-fifth of its veneer and plywood are produced in the area (Bassett, 1977).

Josephine County is essentially rural with an economic structure based on natural resources. Of greatest economic importance are industries associated with the forest resource. The second is agriculture and third recreation/tourism. Dependence upon the lumber and wood products industry, which in turn is dependent on national economic conditions, causes repercussion throughout the local economy with every change in the basic industry. Seasonal cyclical fluctuations increase the problem (SEP, Medford).

Land Area by County

Josephine County contains 68 per cent of the JSYU land area, (28 per cent of Josephine County land area): Douglas County contains 19 per cent of the JSYU land area (12 per cent of Douglas County land area);

Curry County contains 9 per cent of the JSYU land area (4 per cent of Curry County land area); and Jackson and Coos counties each contain less than 5 per cent of the JSYU land area (less than 1 per cent of each county's land area). For additional detail see Tables 2.1.3-9, 10 and 11.

Timber Harvest & Processing Locations

Immediate destinations of logs harvested from the JSYU in 1973-75 were: Grants Pass (27 per cent) and Merlin (26 per cent), for 53.1 per cent within Josephine County; Glendale (36.4 per cent) and Roseburg (2.4 per cent), for 38.8 per cent within Douglas County; and Medford (8.1 per cent) within Jackson County (See Table 2.1.3-23).

Commercial Timberland

Public lands account for 26 per cent of the commerical timberland in the area encompassed by Coos, Curry, Douglas, Jackson and Josephine Counties. Private lands account for 42 per cent of the acreage while 33 per cent is national forest land (Bassett, 1977, Table 2). The above source indicates that during 1975, BLM-administered public lands in Josephine County accounted for 31 per cent of the commercial timberland, compared with 35 per cent for national forest and 28 per cent for private lands. Comparing the above estimates with data from Table 2.1.3-9, it appears that national forest lands include higher proportions of commercial timberlands than do either private or BLM-administered public lands. From that analysis, one may conclude that relative land

area is not a valid indicator of timber-related economic potential. (For a summary see Table 2.1.3-21).

Timber Harvest/Process:Balance

Of all timber produced in 1970-74 in Josephine County, public lands were the source of 50 per cent. For the southern Oregon counties, public lands contributed 25 per cent of timber harvested during the same period (See Table 2.1.3-23). Because logs are shipped across county lines, harvest data do not adequately portray dependence of the local economy. Josephine County mills processed 28 per cent more timber during 1972 than was harvested from Josephine County timberlands (Schuldt, December, 1974). During 1968, timber harvested and timber processed in Josephine County were approximately equal; however, of the total processed, only 60 per cent was harvested from Josephine County forests (approximately 47 per cent of timber processed in Josephine County during 1972 originated in the county). The point of this analysis is to clarify that inferences regarding the local economic base dependent upon timber harvested must reflect differences in Income/Timber harvest ratios due to intercounty log flows.

Regional and Metro Service Centers

Glendale is on the southern edge of Douglas County, adjoining Josephine County, 26 miles and 48 miles from the regional service centers of Grants Pass and Roseburg respectively. Glendale is about four miles

Table 2.1.3-9

Land Ownership. Coos, Curry, Douglas, Jackson and Josephine Counties, Oregon, Circa 1973-76*

	Counties					
	Coos	Curry	Douglas	Jackson	Josephine	Total
		- - square miles - -				
Federal	348	976	2448	1300	951	6023
Public Lands	260	106	1023	674	488	2551
JSYU	3.5	57.0	125.2	23.9	455.4	665
O&C	3.5	56.6	120.4	19.5	392.1	592
Other		0.4	4.8	4.4	63.3	73
Outside JSYU	256.5	49	898	650	33	1886
National Forest	88	870	1425	626	463	3472
State	101	18	76	8	13	216
JSYU	-	-	11.3	1	1.7	24
Local	34	3	46	14	50	147
JSYU	-	-	-	-	43.8	44
Private	1144	632	2519	1498	611	6404
JSYU	-	2.1	130.4	26.4	446.9	606
Total	1627	1629	5089	2821	1625	12791
	3	59	267	51	957	1339

Source: For county-wide estimates:
Loy, William G., et. al., Atlas of Oregon, University of Oregon, Eugene, Oregon, 1976 pages 20 and 72.
For Josephine Sustained Yield Unit:
B.L.M., Josephine Planning Area Analysis Medford District Office, January 1977.

Table 2.1.3-10

Land Ownership. Coos, Curry, Douglas, Jackson and Josephine Counties, Oregon, (Percentage distributions by selected categories) circa 1973-76*

	Counties					
	Coos	Curry	Douglas	Jackson	Josephine	(All Counties)
Federal	21%	60%	48%	46%	58%	47%
Public Lands	16	7	20	24	30	20
JSYU	-	4	2	1	28	5
O&C	-	4	2	1	24	5
Other	-	-	-	-	4	1
Outside JSYU	16	3	18	23	2	15
National Forest	5	53	28	22	28	27
State	6	1	1	-	1	2
			-	-	1	-
Local	2	-		1	3	1
			-	-	3	-
Private	70	39	50	53	38	50
	-	-	-	-	28	5
Total JSYU	-	4	5	2	59	10.5

*Derived from data displayed in Table 2.1.3-9. Percentages may not add to 100 due to rounding.

Table 2.1.3-11

Land Ownership, Coos, Curry, Douglas, Jackson and Josephine Counties, Oregon, (Percentage of the Regional Total by County, for selected categories, circa 1973-75)

	Coos	Curry	Douglas	Jackson	Josephine	(All Counties)
Federal	6%	16%	41%	22%	16%	100%
Public Lands	10	4	40	26	19	100
JSYU	1	9	19	4	68	100
O&C	1	10	20	3	66	100
Other	-	1	7	6	87	100
Outside JSYU	17	3	48	34	2	100
National Forest	3	25	41	18	13	100
State	47	8	35	4	6	100
in JSYU	-	-	47	4	49	100
Local	23	2	31	10	34	100
in JSYU	-	-	-	100	-	100
Private	18	10	39	23	10	100
in JSYU	-	-	22	4	74	100
Total	13	13	40	22	13	100
JSYU	-	4	20	4	72	100

Source: Derived from data displayed in Table 2.1.3-9. Percentages may not add to 100 due to rounding.

from Interstate Highway 5, at a point 55 miles north of Medford, which is the nearest metropolitan service center (Loy, 100).

Counties to be Described

Based upon patterns of coincidence of the JSYU with county areas, log destinations, location of commercial timberlands, and trade and service regions, the primary focus of the socio-economic discussion will be our Josephine County secondarily the Douglas County social and economic attributes likely to be related to the proposed action will be described. Coos, Curry, and Jackson Counties will be minimally addressed consistent with expected intensity of likely socio-economic impacts relative to Josephine and Douglas Counties.

Population Characteristics

The population of Josephine County in 1970 was 35,746, up from 29,919 in 1960. Estimated population in 1975 was 45,500 (PSU, CPRC, February, 1976). The county population is projected to increase to 55,700 by 1980 and 71,600 by 2000.

Population density averages 22 persons per square mile, ranging from 1780 in and near Grants Pass to .3 in remote parts of the unit (SEP, Medford). Six per cent of the population lives on farms, 42 per cent is rural non-farm, and 52 per cent is urban. The major urban area is Grants Pass, the county seat, which had a 1972 population of 12,875.

From 1960 to 1970, the population had a natural increase of 5.8 per cent (below the state average) and a net migration increase of 13.7 per cent (above state average). A significant portion of in-migration to Josephine County consists of retired persons. More than 15 per cent of the population is 65 or older, compared with the State average of 10.8 per cent (Census). Out-migration of persons in the 20-34 age bracket also occurs.

There is little racial diversity in the county. According to the 1970 census, Josephine County was 97 per cent Caucasian. The largest single ethnic minority consisted of Spanish speaking people (1.76 per cent). There was a total of 235 Indians, 32 Orientals, 8 Negroes and 71 others.

Population Change

Population in Josephine County has been increasing at 4.7 per cent per year, a rate exceeding by a factor of 1.5 that for Oregon during 1970-76. In 1960-70, population grew at an annual rate of 1.8 per cent, barely in excess of the 1.7 per cent rate for the State. Rural population declined by a total of 13 per cent, while urban population increased during the same pêriod by 85 per cent. Population has been growing and inducing changes at an accelerating rate. Josephine County population has been increasing more rapidly than in the United States, Oregon, and the southwest Oregon counties for every year since 1970 except 1974-75. (See Figure 2.1.3-9 and Table 2.1.3-12).

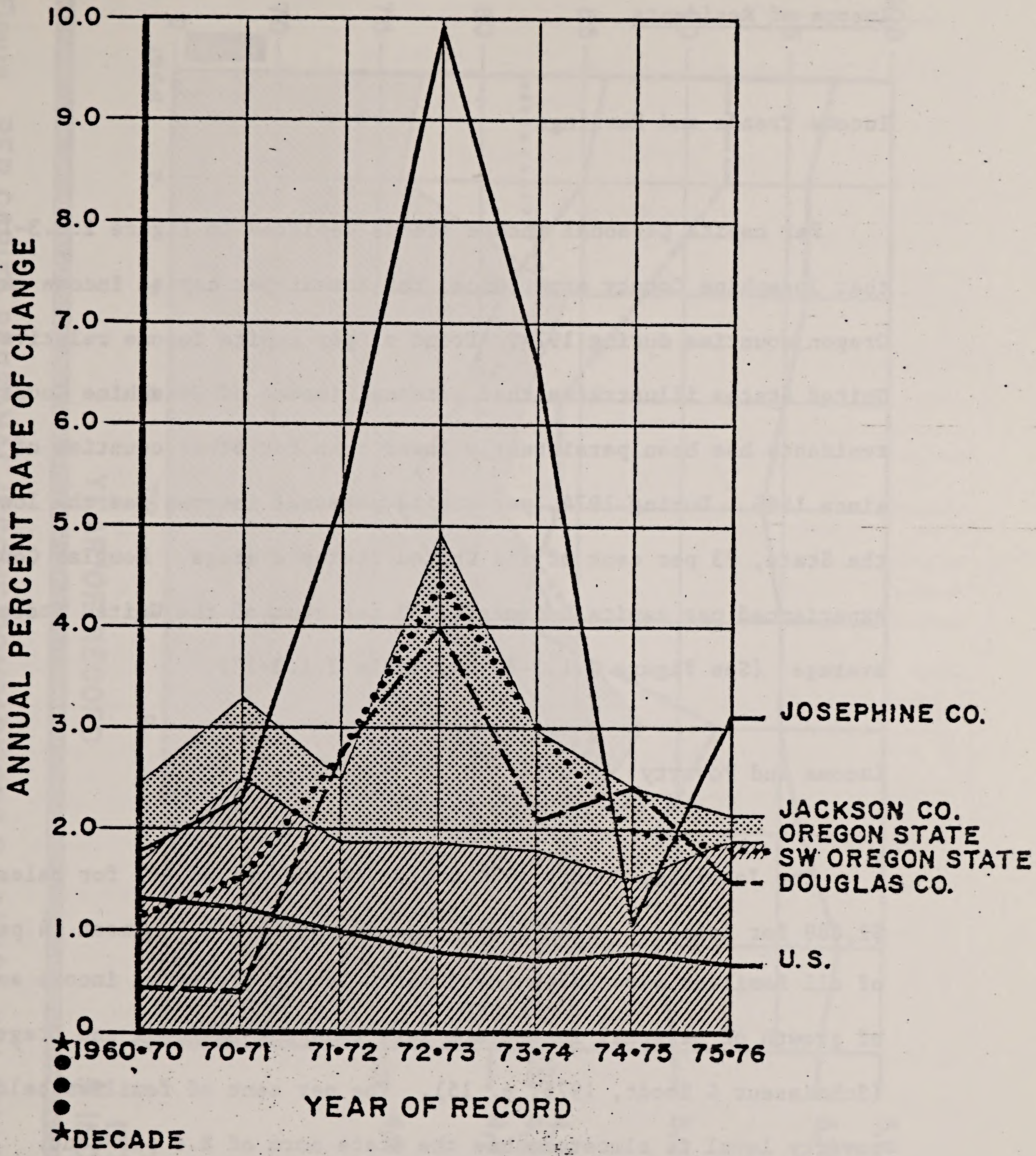


Figure 2.1.3-9 ANNUAL RATE OF POPULATION CHANGE

SOURCE: U.S. Data: U.S. Bureau of Census, Current Population Reports, series P•25 (various), 1960 PC(1)•39C, & 1970 PC(1)•C39

State & County Data: Portland State University, Population Research & Census Center, estimates 1971•1976

Income of Residents

Income Trends and Earnings

Per capita personal income trends depicted in Figure 2.1.3-10 show that Josephine County experienced the lowest per capita income among Oregon counties during 1974. Trend of per capita income relative to the United States illustrates that personal income of Josephine County residents has been persistently lower than for other counties of Oregon since 1966. During 1974, per capita personal incomes was the lowest in the State, 73 per cent of the United States average. Douglas County experienced per capita incomes at 83 per cent of the United States average (See Figure 2.1.3-10 and Table 2.1.3-12).

Income and Poverty

The Josephine County 1970 median income was $6,861 for males and $2,689 for females. Mean family income was $8,484. Almost 14 per cent of all families were below the poverty level. Personal income and rate of growth of personal income are less than the national and Oregon norms (Schmisseur & Boodt, 1975, p. 15). The per cent of families below the poverty level is almost double the State norm of 8.6 per cent.

Sources of Income

Personal income includes wages, salaries, property income and transfer payments (such as pensions, Social Security, and unemployment compensation). Most personal income is derived from wages and salaries.

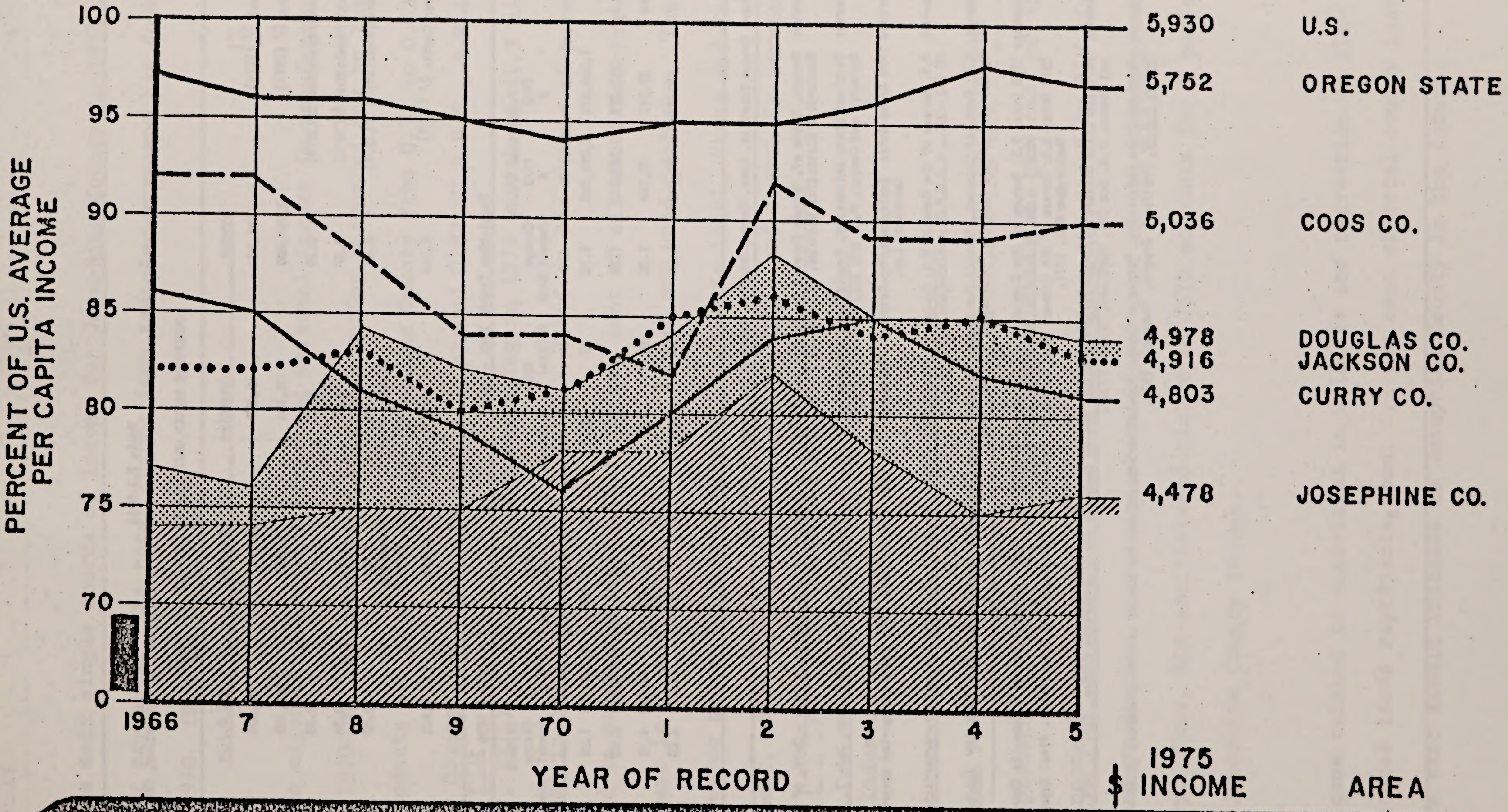


Figure 2.1.3-10 PER CAPITA PERSONAL INCOME COMPARISONS & TRENDS RELATIVE TO U.S. LEVELS 1966•1975

SOURCE: U.S. Department of Commerce, Regional Economics Information System, Bureau of Economic Analysis, Washington, D.C., May 1977

Table 2.1.3-12

Employment, Population and Income, 1974 and Ratio of Labor Force/Employment to Population, 1974 and 1970

JOSEPHINE MASTER UNIT RELATED COUNTIES AND OREGON

	Oregon	Josephine	Douglas	C.C.D.J.J.*
Employment 1/ (1974)	791,863	10,398	26,143	90,803
Population 2/ (1974)	2,266,000	45,100	78,500	304,420
Employment/Population 3/ (1974)	0.35	0.23	0.33	0.30
Employment/Population 4/ (1970)	0.37	0.30	0.34	0.34
Labor Force/Population 4/ (1970)	0.41	0.34 (Grants Pass) (0.36)	0.37 (Roseburg) (0.40)	0.37
Income per Capita 5/ (1974)	5,284	3,977	4,508	4,433

	Population Trends 1960 - 1970							1970 - 1976 7/		Population - Projections	
	Population 6/ 1960 #	Population 6/ 1970 #	Change Annual Rate	Urban % Total	Urban % Change	Rural % Total	Rural % Change	1976 7/	1970-76 Change Annual Rate	Population Projections (1,000's) 1980	Population Projections (1,000's) 1990
Oregon	1,768,675	2,091,385	1.7%	67	+28	33	+3	2,341,750	1.9%	2,496.7	2,835.8
C.C.D.J.J.*	241,276	271,543	1.2%					316,100	2.6%	345.0	393.6
Josephine	29,917	35,746	1.8%	52	+83	48	-13	47,000	4.7%	55.7	66.3
Douglas	68,458	71,743	0.5%	34	+24	66	-3	81,500	2.2%	87.2	98.3

* Southern Oregon Counties, Coos, Curry, Douglas, Jackson and Josephine combined.

1/ Source: Oregon, State of, Oregon Covered Employment and Payrolls by Industry, County and Month 1974 - Dept. of Human Resources, Employment Research & Statistics Section, RS. Pub. 21 (5-76), Salem, Oregon May 1976.

2/ Source: Portland State University, Population Estimates of Counties and Incorporated Cities of Oregon, July 1, 1974. Center for Population Research and Census, P.O. Box 751, Portland, Oregon 97207. 1975

3/ Derived from above data: Employment/Population. "Employment" in this case includes only those categories covered by the State Unemployment Insurance Law.

4/ Source: U.S. Bureau of the Census, U.S. Census of Population: 1960. General Social and Economic Characteristics, Oregon. Final Report PC (1) -39C., U.S.G.P.O., Washington D.C., 1961

5/ Source: U.S. Dept. of Commerce, "Oregon Per Capita Personal Income, Counties, in Selected Years 1966-74" Regional Economics Information S Bureau of Economic Analysis, Washington D.C. May 1976.

6/ Sources: 1960 Data; U.S. Bureau of the Census, U.S. Census of Population: 1960. General Social & Economic Characteristics, Oregon, Final PC (1) - 39C, U.S.G.P.O., Washington D.C. 1961.
1970 Data; U.S. Bureau of the Census, U.S. Census of Population; 1970 Number of Inhabitants, Final Report PC (1) -A39, Oregon U.S. Washington D.C. 1971.

7/ Source: Portland State University, Population Estimates: Oregon Counties and Incorporated Cities, July 1, 1976. Center for Population Res and Census, P.O. Box 751, Portland, Oregon 97207.

8/ Source: Portland State University, "State of Oregon Population Projections for Oregon and its Counties: 1975 - 2000 "Population Bulletin Series P-2 #2, Portland, Oregon. February 1976.

The main single source of income for Josephine County in 1974 was transfer payments. The total income from transfer payments has doubled since 1970 (See Table 2.1.3-13).

The major single source of earned personal income is manufacturing. During 1970-74, the proportion of manufacturing accounted for by lumber, wood products and paper ranged in Josephine County from 0.75 to 0.83; in Douglas County, the ratio was stable at around 0.88 (U.S.D.C., R.E.I.S., January, 1977). Income from manufacturing in 1974 was about $1.5 million less than in 1973 (See Table 2.1.3-13). Based on the number of persons employed in manufacturing in 1975, 79 per cent of all manufacturing employment is directly concerned with lumber and wood products. The second major source of earned personal income is local, State and Federal government, third is wholesale and retail trade and fourth is services.

Timber Industry Sources of Income

Local personal income dependent directly and indirectly on the forest products industry accounts for approximately 42 per cent of the total income in Josephine County, and the income generated by BLM timber sales and production represents about 20 per cent of the forest products industry. Thus, BLM-administered timber in JSYU accounts for 8 per cent of the Josephine County income.

Income related to activities in wildlife and recreation on BLM-administered lands represents about 1.2 per cent of total county income, a figure that should increase in Josephine County in the future.

Table 2.1.3-13d

DOUGLAS CO., OREGON ---------------- PERSONAL INCOME BY MAJOR SOURCES 1970-74 (THOUSANDS OF DOLLARS)

ITEM	1970	1971	1972	1973	1974
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK 1/					
BY TYPE					
WAGE AND SALARY DISBURSEMENTS 2/	158,823	181,399	207,922	233,361	254,484
OTHER LABOR INCOME	7,561	9,227	11,337	12,910	14,620
PROPRIETORS INCOME	20,261	20,880	24,696	29,339	29,953
FARM	36	-1,191	168	2,897	2,065
NONFARM	20,225	22,071	24,528	26,442	27,888
BY INDUSTRY					
FARM	715	-521	785	3,704	2,882
NONFARM	185,930	212,027	243,170	271,906	296,175
PRIVATE	151,332	174,189	201,639	225,846	243,711
MANUFACTURING	83,959	98,773	116,148	130,406	137,800
MINING	2,134	2,419	2,451	3,219	4,278
CONTRACT CONSTRUCTION	9,458	11,302	14,066	15,656	16,571
WHOLESALE AND RETAIL TRADE	23,662	25,872	28,991	31,430	34,757
FINANCE, INSURANCE, AND REAL ESTATE	3,884	4,566	4,937	5,280	5,854
TRANSP., COMM. + PUBLIC UTILITIES	8,967	10,603	11,786	13,120	14,979
SERVICES	18,042	19,547	21,910	25,173	27,711
OTHER INDUSTRIES	1,226	1,107	1,350	1,554	1,761
GOVERNMENT	34,598	37,838	41,531	46,060	52,464
FEDERAL, CIVILIAN	12,372	13,391	14,720	15,429	17,160
FEDERAL, MILITARY	1,092	1,148	1,349	1,520	1,646
STATE AND LOCAL	21,134	23,299	25,462	29,111	33,658
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE					
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	186,645	211,506	243,955	275,610	299,057
LESS: PERSONAL CONTRIBUTIONS FOR SOCIAL INSURANCE BY PLACE OF WORK	8,601	11,274	13,106	16,499	18,475
NET LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	178,044	200,232	230,849	259,111	280,582
PLUS: RESIDENCE ADJUSTMENT	-3,344	-4,035	-4,716	-5,208	-5,732
NET LABOR AND PROPRIETORS INCOME BY PLACE OF RESIDENCE	174,700	196,197	226,133	253,903	274,850
PLUS: DIVIDENDS, INTEREST, AND RENT	28,650	32,878	36,690	38,422	43,356
PLUS: TRANSFER PAYMENTS	27,577	30,898	33,940	40,212	50,469
PERSONAL INCOME BY PLACE OF RESIDENCE	230,927	259,973	296,763	332,537	368,675
PER CAPITA INCOME	3,204	3,525	3,978	4,194	4,508
TOTAL POPULATION (THOUSANDS)	72.1	73.8	74.6	79.3	81.8

1/ EQUALS THE SUM OF WAGES, OTHER LABOR INCOME AND PROPRIETORS INCOME
2/ PRIMARY SOURCE FOR PRIVATE NON-FARM WAGES: ES-202 COVERED WAGES - OREGON EMPLOYMENT DIVISION

TABLE 5.00

REGIONAL ECONOMICS INFORMATION SYSTEM
BUREAU OF ECONOMIC ANALYSIS

Table 2.1.3-13d(a)

DOUGLAS CO., OREGON -------------- PERSONAL INCOME BY MAJOR SOURCES 1970-74

ITEM	PERCENT OF US 1974	PERCENT CHANGE 74/70	PERCENT CHANGE 74/73	PERCENT OF TOTAL EARNINGS 1974	LOCATION QUOTIENT 1974	PERCENT OF STATE 1974
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK 1/						
BY TYPE						
WAGE AND SALARY DISBURSEMENTS 2/	.0336	60	9			3.32
OTHER LABOR INCOME	.0285	93	13			2.99
PROPRIETORS INCOME	.0342	48	2			2.42
FARM	.0073	5636	-29			.47
NONFARM	.0469	38	5			3.48
BY INDUSTRY						
FARM	.0087	303	-22	.96	.2615	.56
NONFARM	.0343	59	9	99.04	1.0283	3.33
PRIVATE	.0345	61	8	81.49	1.0350	3.35
MANUFACTURING	.0574	64	6	46.08	1.7210	5.77
MINING	.0439	100	33	1.43	1.3148	17.37
CONTRACT CONSTRUCTION	.0297	75	6	5.54	.8896	2.73
WHOLESALE AND RETAIL TRADE	.0235	47	11	11.62	.7041	1.99
FINANCE, INSURANCE, AND REAL ESTATE	.0125	51	11	1.96	.3745	1.37
TRANSP., COMM. + PUBLIC UTILITIES	.0231	67	14	5.01	.6933	2.05
SERVICES	.0201	54	10	9.27	.6026	2.11
OTHER INDUSTRIES	.0624	44	13	.59	1.8707	3.57
GOVERNMENT	.0333	52	14	17.54	.9982	3.29
FEDERAL, CIVILIAN	.0453	39	11	5.74	1.3567	4.79
FEDERAL, MILITARY	.0082	51	8	.55	.2446	2.20
STATE AND LOCAL	.0338	59	16	11.25	1.0145	2.89
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE						
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	.0334	60	9	100.00		3.18
LESS: PERSONAL CONTRIBUTIONS FOR SOCIAL INSURANCE BY PLACE OF WORK	.0387	115	12			3.45
NET LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	.0331	58	8			3.17
PLUS: RESIDENCE ADJUSTMENT						
NET LABOR AND PROPRIETORS INCOME BY PLACE OF RESIDENCE	.0324	57	8			3.13
PLUS: DIVIDENDS, INTEREST, AND RENT	.0266	51	13			2.63
PLUS: TRANSFER PAYMENTS	.0360	83	26			3.26
PERSONAL INCOME BY PLACE OF RESIDENCE	.0320	60	11			3.08

1/ EQUALS THE SUM OF WAGES, OTHER LABOR INCOME AND PROPRIETORS INCOME
2/ PRIMARY SOURCE FOR PRIVATE NON-FARM WAGES: ES-202 COVERED WAGES - OREGON EMPLOYMENT DIVISION

Table 2.1.3-13 J-A

JOSEPHINE CO., OREGON -------------- PERSONAL INCOME BY MAJOR SOURCES 1970-74 (THOUSANDS OF DOLLARS)

ITEM	1970	1971	1972	1973	1974
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK 1/					
BY TYPE					
WAGE AND SALARY DISBURSEMENTS 2/	56,039	64,733	74,603	85,865	88,523
OTHER LABOR INCOME	2,670	3,311	4,041	4,725	4,933
PROPRIETORS INCOME	12,817	13,460	14,721	17,445	18,292
FARM	817	353	508	1,234	1,180
NONFARM	12,000	13,107	14,213	16,211	17,112
BY INDUSTRY					
FARM	1,360	890	1,002	1,879	1,832
NONFARM	70,166	80,614	92,363	106,156	109,916
PRIVATE 3/	55,961	64,844	74,971	85,621	86,215
MANUFACTURING	22,386	25,728	30,576	34,290	32,715
MINING	(D)	(D)	(D)	736	859
CONTRACT CONSTRUCTION	3,087	4,081	5,219	6,821	6,679
WHOLESALE AND RETAIL TRADE	14,540	17,006	18,774	21,068	20,929
FINANCE, INSURANCE, AND REAL ESTATE	2,143	2,468	2,938	3,090	3,498
TRANSP., COMM. + PUBLIC UTILITIES	4,000	4,545	5,434	6,190	6,772
SERVICES	8,825	9,803	10,851	12,722	13,828
OTHER INDUSTRIES	(D)	(D)	(D)	696	935
GOVERNMENT	14,205	15,770	17,392	20,535	23,701
FEDERAL, CIVILIAN	3,007	3,239	3,535	4,011	4,562
FEDERAL, MILITARY	433	487	553	654	712
STATE AND LOCAL	10,765	12,044	13,304	15,870	18,427
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE					
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	71,526	81,504	93,365	108,035	111,748
LESS: PERSONAL CONTRIBUTIONS FOR SOCIAL INSURANCE BY PLACE OF WORK	3,278	4,199	4,894	6,216	6,610
NET LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	68,248	77,305	88,471	101,819	105,138
PLUS: RESIDENCE ADJUSTMENT	174	153	145	33	441
NET LABOR AND PROPRIETORS INCOME BY PLACE OF RESIDENCE	68,422	77,458	88,616	101,852	105,579
PLUS: DIVIDENDS, INTEREST, AND RENT	21,570	23,945	26,589	26,930	30,375
PLUS: TRANSFER PAYMENTS	21,755	25,412	28,513	33,738	42,850
PERSONAL INCOME BY PLACE OF RESIDENCE	111,747	126,815	143,718	162,520	178,804
PER CAPITA INCOME	3,112	3,292	3,704	3,811	3,977
TOTAL POPULATION (THOUSANDS)	35.9	38.5	38.8	42.6	45.0

1/ EQUALS THE SUM OF WAGES, OTHER LABOR INCOME AND PROPRIETORS INCOME
2/ PRIMARY SOURCE FOR PRIVATE NON-FARM WAGES: ES-202 COVERED WAGES - OREGON EMPLOYMENT DIVISION
3/ (D) NOT SHOWN TO AVOID DISCLOSURE OF CONFIDENTIAL INFORMATION. DATA ARE INCLUDED IN TOTALS.

TABLE 5.00

REGIONAL ECONOMICS INFORMATION SYSTEM
BUREAU OF ECONOMIC ANALYSIS

Table 2.1.3-13 J-A

JOSEPHINE CO. OREGON — PERSONAL INCOME BY MAJOR SOURCES 1970-74

ITEM	PERCENT OF US 1974	PERCENT CHANGE 74/70	PERCENT CHANGE 74/73	PERCENT OF TOTAL EARNINGS 1974	LOCATION QUOTIENT 1974	PERCENT OF STATE 1974
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK 1/						
BY TYPE						
WAGE AND SALARY DISBURSEMENTS 2/	.0117	58	3			1.15
OTHER LABOR INCOME	.0096	85	4			1.01
PROPRIETORS INCOME	.0209	43	5			1.48
FARM	.0042	44	-4			.27
NONFARM	.0288	43	6			2.13
BY INDUSTRY						
FARM	.0055	35	-3	1.64	.4448	.36
NONFARM	.0127	57	4	98.36	1.0212	1.24
PRIVATE 3/	.0122	54	1	77.15	.9798	1.18
MANUFACTURING	.0136	46	-5	29.28	1.0934	1.37
MINING	.0088	(D)	17	.77	.7065	3.49
CONTRACT CONSTRUCTION	.0120	116	-2	5.98	.9595	1.10
WHOLESALE AND RETAIL TRADE	.0141	44	-1	18.73	1.1347	1.20
FINANCE, INSURANCE, AND REAL ESTATE	.0075	63	13	3.13	.5909	.82
TRANSP., COMM. + PUBLIC UTILITIES	.0105	69	9	6.06	.8389	.93
SERVICES	.0100	57	9	12.37	.8047	1.05
OTHER INDUSTRIES	.0331	(D)	34	.84	2.6579	1.90
GOVERNMENT	.0150	67	15	21.21	1.2069	1.49
FEDERAL, CIVILIAN	.0120	52	14	4.08	.9653	1.27
FEDERAL, MILITARY	.0035	64	9	.64	.2831	.95
STATE AND LOCAL	.0185	71	16	16.49	1.4864	1.58
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE						
TOTAL LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	.0125	56	3	100.00		1.19
LESS: PERSONAL CONTRIBUTIONS FOR SOCIAL INSURANCE BY PLACE OF WORK	.0138	102	6			1.23
NET LABOR AND PROPRIETORS INCOME BY PLACE OF WORK	.0124	54	3			1.19
PLUS: RESIDENCE ADJUSTMENT						
NET LABOR AND PROPRIETORS INCOME BY PLACE OF RESIDENCE	.0124	54	4			1.20
PLUS: DIVIDENDS, INTEREST, AND RENT	.0186	41	13			1.84
PLUS: TRANSFER PAYMENTS	.0306	97	27			2.77
PERSONAL INCOME BY PLACE OF RESIDENCE	.0155	60	10			1.49

1/ EQUALS THE SUM OF WAGES, OTHER LABOR INCOME AND PROPRIETORS INCOME
2/ PRIMARY SOURCE FOR PRIVATE NON-FARM WAGES: ES-202 COVERED WAGES - OREGON EMPLOYMENT DIVISION
3/ (D) NOT SHOWN TO AVOID DISCLOSURE OF CONFIDENTIAL INFORMATION. DATA ARE INCLUDED IN TOTALS.

Table 2.1.3-14

Employment Composition by Sector
Oregon, and Josephine and Douglas
Counties, 1969

Economic Sector	Oregon	Josephine	Douglas
	% A	% (ratio) B (B/A)	% (ratio) C (C/A)
Agriculture & Food Processing	7.3	6.4 (0.9)	6.5 (0.9)
Mining	0.2	0.2 (1.0)	0.9 (5.1)
Construction	5.8	6.4 (1.1)	5.6 (1.0)
Logging and Wood Products Mfr.	8.3	16.4 (2.0)	26.3 (3.2)
Other Mfr.	11.3	7.6 (0.7)	6.4 (0.6)
Transportation	4.1	2.6 (0.6)	2.5 (0.6)
Utilities	3.1	2.5 (0.8)	2.2 (0.7)
Trade	18.3	18.2 (1.0)	14.8 (0.8)
Services	11.7	10.4 (0.9)	8.2 (0.[illegible]
Tourist Related Trade & Services	7.8	9.1 (1.2)	7.0 (0.9)
Medical & Education & Other Prof.	17.3	15.3 (0.9)	15.5 (0.9)
Government	4.9	4.9 (1.0)	4.1 (0.8)

Source: Derived from U. S. Bureau of Census, 1972.

Table 2.1.3-15

Employment, Josephine County

Industry	Employment in 1940	1950	1960	1970
Agriculture, forestry, & fisheries...	1,686	1,700	974	598
Mining..............................	473	113	44	20
Contract construction...............	264	592	671	695
Manufacturing.......................	533	2,623	2,708	2,693
Food & kindred products............	86	97	101	93
Textile & apparel products.........	2	6	4	50
Lumber. wood products, furniture...	358	2,381	2,323	1,776
Printing & publishing..............	49	76	120	135
Chemical & allied products.........	4	2	0	4
Electrical & other machinery.......	5	18	61	99
Transportation equipment...........	4	5	38	317
Other & miscellaneous manufacturing	25	38	61	219
Railroads & rail express............	51	73	52	50
Trucking & warehousing..............	50	87	155	130
Other transporation.................	19	42	69	102
Communications......................	25	55	83	149
Utilities & sanitary service........	52	174	166	118
Wholesale trade.....................	65	233	228	310
Food & dairy product stores.........	143	260	308	317
Eating & drinking places............	157	318	371	436
Other retail trade..................	458	897	955	1,350
Finance, insurance, real estate......	89	217	328	433
Hotels & other personal services......	263	361	414	433
Private households....................	165	200	307	119
Business & rapair services............	148	320	264	320
Entertainment, recreation services....	39	69	51	118
Medical, other professional services..	356	673	1,041	1,922
Public administration.................	148	233	274	536
TOTAL.....................	5,184	$9,240	9,463	10,849
Unemployment..............	a/	631	1,096	1,169

a/ Not available.

SOURCE: U.S. Department of Commerce, Census of Population.

Table 2.1.3-16

Comparative Economic Structure as Indicated by Employment, 1975

	Josephine County Number	Josephine County Percent	Oregon Number	Oregon Percent	United States Percent
Total employment*	15,515		930,000		
Agriculture	460		37,700		
Self-employed	3,330		112,100		
Total nonagricultural Wage and salary	11,840	100.0	830,800	100.0	100.0
Manufacturing	2,900	24.5	182,300	21.9	23.8
Lumber & Wood Prod.	1,890	16.0	67,000	8.1	0.7
Food Products	60	0.5	22,600	2.7	2.2
Other Manufacturing	950	8.0	92,700	11.2	20.9
Nonmanufacturing	8,940	75.5	648,500	78.1	76.2
Mining	0	0.0	1,500	0.2	1.0
Contract constr.	400	3.4	34,800	4.2	4.5
Transportation, communications, public utilities	520	4.4	49,500	6.0	5.8
Trade	2,770	23.4	196,500	23.7	22.0
Finance, insurance, and real estate	440	3.7	44,700	5.4	5.5
Service & misc.	1,730	14.6	145,000	17.5	18.2
Government	3,080	26.0	176,500	21.2	19.2

Sources: County and State data from State Employment Division
U.S. data from Employment and Earnings, DOL, Bureau of Labor Statistics, January, 1976.

* Components do not add to total because "total employment" is on a "place of residence" basis, whereas "non-agricultural" employment is reported on the basis of location of the establishment.

Table 2.1.3-17

Earnings by Timber Industry Source, as a Percent of Total Personal Income of Residents, Josephine Co., Douglas Co., and Oregon 1970 and 1974

	Lumber & Furniture Lumber & Wood Prod. Furniture	Paper & Allied Products	Total Wood
Josephine Co.	%	%	%
Year		a/	
1970	14.9	w	15.1
1971	15.7	w	15.9
1972	17.0	w	17.2
1973	16.5	w	16.8
1974	14.0	w	14.4
Douglas Co.			
Year			
1970	30.0	w	31.3
1971	32.1	w	33.3
1972	33.0	w	34.3
1973	33.0	w	34.2
1974	30.8	w	32.0
Oregon			
Year			
1970	7.8	1.3	8.2
1971	8.1	1.2	8.5
1972	8.6	1.2	8.9
1973	8.5	1.2	8.8
1974	7.7	1.2	8.0

Source: Derived from U.S.D.C., Regional Economics Information System (Special request January, 1977).

a/ w - Indicates that data are withheld to avoid possible disclosure of confidential information regarding a single firm.

Economic Stability, Composition and Unemployment

Composition

During 1970, logging and wood products manufacture accounted for 16.4 per cent and 26.3 per cent of total employment in Josephine and Douglas Counties respectively (8.3 per cent for Oregon), as shown in Table 2.1.3-14. Data of an equally comprehensive nature are unavailable for subsequent years; however, "covered" employment data for 1970 and 1975 indicate that the percentage of employment in lumber and wood products relative to the statewide average has remained constant for Josephine and Douglas Counties. Because definitions of "covered employment" and "lumber and wood products" (Standard Industrial Classifications 24 and 26) changed between 1970 and 1975, it is impossible to provide directly comparable data on the percentage of total employment by individual categories. Ratios, calculated as above, for Josephine County were 2.2 for both 1970 and 1975; for Douglas County, the 1970 ratio was 3.6 and, in 1975, 3.5. It appears valid to generalize that the local economy has experienced only such shifts in structure as are consistent with the State pattern during the reference period (Oregon Covered Employment and Payrolls, 1970, 1974 and 1975). An additional and more comprehensive check on economic structure shifts is afforded for 1970-to-1974 comparisons by the Regional Economics Information System, U.S. Department of Commerce. Personal income originating from lumber and wood products, excluding furniture, increased 51 per cent and 64 per cent (total wage and salary disbursements increased 60 per cent for each county) for Josephine and Douglas County respectively.

The proportion of total personal income directly originating as wages, salaries and proprietorship earnings from wood products industries was stable, based upon comparisons for 1970 and 1974 (the most recent data). For Josephine County, the proportion was 15.2 per cent for both years; for Douglas County the proportions were 31.3 per cent and 32.0 per cent for 1970 and 1974 respectively Oregon displayed similar stability of timber-based earnings to total personal income of 9.4 per cent and 9.2 per cent for 1970 and 1974 respectively. During the intervening years there was a slight bulge in the percentage of total income originating from wood products industries (See Table 2.1.3-17).

Stability

With regard to stability, communities may be concerned about the extent of year-to-year variability and seasonal (within year) variability of employment. Data related to stability are displayed in Tables 2.1.3-18 and 19. Seasonal variation in lumber and wood products employment has increased from a coefficient of variation of 10 per cent in 1970 to 17 per cent in 1975 for Josephine County. This fact has more meaning, perhaps, when viewed in comparison with the coefficient of variation for total employment of 8 per cent in 1970 and 9 per cent in 1975. BLM timber sales policy and practice are unlikely to influence seasonal variability in local timber industry employment. The coefficient of variation of average annual employment between years was 11 per cent for Josephine County for 1970-76. The maximum deviation from average during the period was 15 per cent.

Table 2.1.3-18

Unemployment Rates, Employment in Lumber & Wood Products for Josephine Co., Douglas Co. and Oregon, 1970 - 1976

	Josephine		Douglas		Oregon	
	Unemployment Rate	Employment in Lumber & Wood Products a/	Unemployment Rate	Employment in Lumber & Wood Products a/	Unemployment Rate	Employment in Lumber & Wood Products a/
1970	10.3	1,840	9.0	7,495	7.1	66,766
1971	10.2	2,090	8.4	8,320	7.6	70,400
1972	9.0	2,360	[illegible].2	8,970	6.8	7,560
1973	9.1	2,360	7.4	9,150	6.2	79,100
1974	12.2	2,140	9.4	8,980	7.5	75,000
1975	15.7	1,890	12.7	8,280	10.6	67,800
1976	13.6	2,450	10.3	8,870	9.5	73,800

a/ These data do not include mobile home manufacturing, which was included in regular Employment Divison reports for years 1975 and 1976.

Source: Telephone report 5/13/77 from Mr. Lynch, Research & Statistics Section, Employment Division, Department of Human Resources, State of Oregon

Table 2.1.3-19

Coefficient of Seasonal (Within Year) and Year-to-Year Variation of Employment in Lumber & Wood Products and Total, Josephine and Douglas Counties, 1970, 1974, and 1975.

	Josephine Co.	Douglas Co.
1970 Lumber & Wood	10%	5%
Total	8	6
1974 Lumber & Wood	14	7
Total	7	4
1975 Lumber & Wood	17	7
Total	9	6
1970-76 Year to Year		
Lumber & Wood	11%	7%

Source: Derived from data in Oregon, State of, Oregon Covered Employment & Payrolls by Industry. County, and Month (appropriate years), R.S. publication 21, Employment Division, Salem, Oregon.

Table 2.1.3-20

Timber Harvest by Ownership,
Josephine County and Douglas County, 1974 and 1975

Land Ownership	MBF	Percent	MBF	Percent
Private	12,972	8.9	648,328	48.8
State	2,710	1.9	29,013	2.2
BLM	70,566	48.6	287,569	21.6
USFS	55,880	38.5	364,134	27.4
Other Public	3,071	2.1	446	-
TOTAL	145,199		1,329,490	100.0
1975				
Private	10,492	10.0	663,936	57.1
State	1,269	1.2	13,281	1.1
BLM	37,682	35.9	178,311	15.3
USFS	51,474	49.0	304,125	26.2
Other Public	4,165	4.0	2,587	0.2
TOTAL	105,082		1,162,240	

Source: USDA Forest Service, 1974 (1975 Oregon Timber Harvest, Resource Bulletin PNW-63(69), January 1976 (December 1976)

Employment in lumber and wood products exhibited greater seasonal stability in Douglas County than in Josephine County, as was the case for total employment for the years analyzed, 1970, 1974 and 1975. The coefficient of variation on year-to-year employment averages was 7 per cent for the 1970-76 period, which was approximately the same as the seasonal variability measure. When the 1970 observation was excluded, the coefficient of variation for Douglas County was reduced to 4 per cent. Whether the timber industry is a stabilizing or destabilizing factor cannot be concluded in general. It appears that for Josephine County, the timber industry contributes instability, whereas for Douglas County, stability is improved by timber industry employment.

Unemployment

Since 1969, the unemployment rate in Josephine County has on the average exceeded the statewide rate by 3.5 points. During recent years Josephine County has frequently experienced the highest unemployment rate among Oregon counties. The Douglas County unemployment rate exceeded the Oregon rate, on the average, by 1.3 points for 1970-1976. (See Table 2.1.3-18).

Summary of Demographic Characteristics

Population

According to data from the Portland State University Center for Population Research and Census, the 1975 population of Josephine County

was 45,600. Approximately 49 per cent of the total population is male. Data provided by the Oregon State Community Services Program, Department of Human Resources (Rohl, 1976), indicate that, in 1974, 29 per cent of the people in the county were less than 18 years old and about 15 per cent over 65. Nearly 99 per cent of the 1975 population of the county were classed as "white," with the remaining 442 "nonwhites" being dominated by American Indians (300), based on statistics gathered by the Jackson-Josephine Job Council (1975).

Residence Location

An overwhelming majority of the people in Josephine County live outside of city and town boundaries. Only 31 per cent of the residents live in towns and cities of 1,000 or more inhabitants. Some 69 per cent of the county dwellers are not considered to live in cities (Kohl, 1976). Yet, as will be shown below, these rural residents are not, by and large, farmers, nor are they employed in the agricultural sector.

Education

Education levels are below the State average; males have significantly less education than the norm (Schmisseur & Boodt, 1975, p. 1? Median years of school completed for females is 12.1, for males 11.7. These figures contrast with the State average of 12.3 for all adults. Information provided (Schmisseur and Boodt, 1975, p. 13) indicates the median school completion level for females in Josephine County was 12.1

years; for males it was 11.7 years. This compares to a median state level, for all adults, of 12.3 years.

Employment

In 1975 there were 18,311 in the Josephine County labor force (Lynch, 1977). As Table 2.1.3-16 indicates, some 15,515 persons in this labor force were employed during 1975. Unemployment rates during 1975 were significantly high, averaging 15.7 per cent for the year and fluctuating from a high of more than 21 per cent during the first quarter of 1975 to a low of about 12 per cent in the third quarter of the year. Average employee earnings in 1975 amounted to $8,429 (Kohl, 1976).

Income

Table 2.1.3-13, summarizing personal income by major sources for Josephine County, shows a per capita 1974 income of $3,977. Data from the Department of Human Resources (Kohl, 1976) indicates the median family income in the county was $10,287, compared with a median State income in 1975 of $13,411. Another aspect of income, again provided by the DHR, is that about 38 per cent of the households in 1974 reported total income of less than $8,000. In other words, a large proportion of the residents of Josephine County are classed, on the basis of annual income, as "poor." The DHR, using the 1970 census guidelines for determining poverty, considers that 5,922 persons in Josephine County would

be in that category on the basis of 1975 earnings. If adjusted to 1975 definition, the poverty figure of course would be higher.

Timber Dependent Industries

Lumber and wood products accounted for 14 to 17 per cent of income received by Josephine County residents in 1970-74. In Douglas County, the figure ranged from 30 to 33 per cent. For the State as a whole, the percentage of wage, salary and proprietorship income from lumber and wood products (Standard Industrial Classification 24) ranged from 7.7 to 8.6. Because lumber and wood products form a major part of the export base for Josephine and Douglas Counties, the direct income generated is only part of the local income dependent upon timber harvest and processing. Douglas County was estimated to be 68.7 per cent dependent upon exports by the forest-oriented sectors (including BLM and USFS) during 1970 (Darr, 1974 page 14). An alternative estimate would indicate that 42 per cent of Douglas County personal income during 1970 was dependent on lumber and wood products. The alternative is based on Standard Industrial Classification 24, which is not as broadly defined as the 68.7 per cent estimate (U.S.D.I., S.E.D.21, 1973 page 42). Based on the latter procedure. Josephine County was 24 per cent dependent upon economic activity generated by the lumber and wood products sector (U.S.D.I., S.E.D.21 p. 43).

Timber Harvest - Income/Employment Relations

The Douglas County interindustry model (Youmans, et.al., December 1973) was used in the Josephine SYU Planning Area Analysis to estimate

parameters relating quantities of locally harvested and processed timber to "direct and indirect" (referred to hereinafter as "total") personal income. Subsequently received information (U.S.D.C., R.E.I.S. 1/77) made it possible to compare the previously derived estimates. With the Douglas County model, the estimate of timber dependent personal income was barely in excess of the "direct" income estimated by the above source.

Josephine County processes more timber than is harvested within the county, whereas the opposite is true for Douglas County. This asymmetry makes it impossible to utilize the analysis of the Douglas County economy directly in developing estimates for Josephine. In the absence of this comprehensive tool, simple ratios of direct income (employment) to quantity of stumpage processed during 1972 are utilized. The most recent data on ntity processed by county are for 1972 (Schuldt, 12/74, Table 4). The estimates are updated to 1974 to provide comparability with other analyses in the Josephine SYU, P.A.A. An additional warning is in order regarding attempts to reliably understand timber harvest impact upon the dependent economy. Some activities included in S.I.C. 24, "Lumber and Wood Products", are resource-dependent, i.e., directly influenced by the level of timber harvest; for example, logging camps and loggir contractors, sawmills and veneer and plywood mills. Others such as wood kitchen cabinet manufacture, millwork, and wood buildings and mobile home manufacture, once established, will respond in level of output to demand factors almost exclusively, as contrasted with timber harvest, or supply forces. The data available include both types

of activities and therefore overstate the likely income and employment impacts of changes in level of timber harvest.

Income/Quantity Processed

During 1972, direct personal income per mbf was $93, $102 and $83 in the Oregon Fir Region, (excluding Hood River County), Josephine County and Douglas County respectively, as derived from Schuldt (December, 1974, Table 4) and U.S.D.C., R.E.I.S. (January, 1977). Employing the income multipliers estimated by the BLM (U.S.D.I., S.E.D., 1973) of 1.538 (Josephine) and 1.414 (Douglas), the total income per thousand board feet processed would be $160 and $120 for Josephine County and Douglas County respectively. Updated to 1974, using harvest/process ratios existing in 1972, the direct personal income per thousand board feet in 1974 was $135 and $114 in Josephine and Douglas Counties respectively. The total (direct plus indirect) personal income per thousand board feet processed is estimated at $207 and $161 for Josephine and Douglas Counties respectively.

Table 2.1.3-24 shows the destination of logs harvested from BLM-administered lands in the Josephine SYU. The harvest shown (126 MMBF) is the three-year average for 1973-75.

Table 2.1.3-22 shows the relationship between total volume harvested and total volume processed by the lumber and wood products industry in Josephine County. It also shows the percentage of the volumes which originated on BLM-administered lands.

Table 2.1.3-21

Percent of Growing Stock and Sawtimber on Commercial Forest Land by County, Total and Public Lands Southwest Oregon January 1, 1975*

		County				
	S.W. Ore Counties	Coos	Curry	Douglas	Jackson	Josephine
Growing Stock 1/ (million cubic feet)	23,251					
All ownerships % of Region		14	11	49	17	10
Public Lands						
% of Region	26%	4	1	12	4	4
% of County	-	31	10	25	25	37
Sawtimber 2/ (MMBF) (Scribner)	104,995					
All Ownerships % of Region		17	11	51	15	7
Public Lands						
% of Region	29%	5	1	15	4	4
% of County	-	33	11	29	28	52

*Source: Derived from: Bassett, Patricia M., Timber Resources for Southwest Oregon, USDA, Forest Service Resource Bulletin PNW -- ____, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon 1977 (Table 9)

1/ Includes trees 5.0 inches d.b.h. and larger.

2/ Includes trees 11.0 inches d.b.h. and larger.

Table 2.1.3-22

Log Flows, All Ownerships, for
Josephine Co. and Douglas Co., 1972

	Location Processed:		Location Harvested:	
	Josephine Co. (% from:)	Douglas Co. (% from:)	Josephine Co. (% to:)	Douglas Co. (% to:)
Josephine Co.	47%	3%	60%	-
Douglas Co.	1%	88%	17%	70%
Coos, Curry, Jackson Co.'s	38% Coos & Curry only	8%	21%	14%
Out-of-Southern Oregon Co.'s	14% Klamath Co. & out-of-state	1%	1%	15%

Source: Derived from: Schuldt, J. P. and J. O.Howard, Oregon Forest Industries: Wood Consumption and Mill Characteristics, O.S.U. Extension Service and PNW Forest and Range Experiment Station, U.S.F.S., OSU Extension Service, Corvallis, Oregon, December.

Table 2.1.3-23

Timber Harvest, Total and Percent from Public Lands, and Southwest Oregon* 1970-75 and Average

	Josephine Co.		Southwest Ore. Counties	
	(mmbf)	(Public Lands)	(mmbf)	(Public Lands)
1970	121	38.4	2,654	23.6
1971	105	48.2	3,058	27.5
1972	194	58.5	3,058	24.9
1973	177	50.4	3,038	28.4
1974	145	48.6	2,692	21.6
1975	105	35.9	2,245	17.7
Year Average	141	48.1	2,824	24.3

Source: U.S.D.A., Timber Harvest by Ownership in the State of Oregon. (1970, 1971, 1972, 1973, and 1974). Forest Survey Project, Pacific Northwest Forest and Range Experiment Station, Forest Service, Portland, Oregon, (July, 1971, August 1972, September 1973, December 1974, January 1976, December 1976)

* Southwest Oregon includes Coos, Curry, Douglas, Jackson and Josephine Counties.

Table 2.1.3-24

Destination of Logs Harvested from O & C Lands in the Josephine SYU, 1973-75 averages

Destination	Annual Average 1973-75 (MMBF)	Percent of Josephine MU Harvest 1973-95
Grants Pass	34	27%
Merlin	33	26%
Josephine Co.	67	53%
Glendale	46	36%
Roseburg	3	2%
Douglas Co.	49	39%
Medford	10	8%
Jackson Co.	10	8%
Total	126	100%

Source: U.S.D.I., Josephine Planning Area Analysis, Medford D.O., BLM, 1977

Table 2.1.3-25

Direct and Indirect Personal Income and Employment Related to Logging and Processing of Timber from Public Lands in JSYU Destination Communities, 1973-75 Average

(Location of Income Effect)		Direct & Indirect Total Personal Income (Million's of $)	Dependent Employment Person's Employed	Population Dependent Thousands of Res.
Within Josephine County				
TOTAL - Industry Harvested & Processed		38.3	3,500	9.6
TOTAL - BLM in JSYU				
Merlin		7.0	630	1.7
Grants Pass		6.8	620	1.7
		13.8	1250	3.4
Percent Attributed to Public Lands in JSYU		36.0	36.0	36.0
TOTAL Personal Income of Residents 1/		178.8		
Timber Industry % 2/	21.4%			
Timber from Public Lands in JSYU %	7.7%			
Out-of-Josephine County				
Glendale (Douglas Co.)		7.4	670	1.8
Roseburg (Douglas Co.)		0.5	50	0.1
Medford (Jackson Co.)		1.8	160	0.5
		9.7	880	2.4
TOTAL Public Lands Josephine M.U. (Within Josephine County plus Out-of-Josephine Co.)		23.5	2,130	5.8

1/ Source: U.S. Dept. of Commerce, Personal Income by Major Sources 1970-74, Table 5, Bureau of Economic Analysis, Regional Economics Information System May 1976.

2/ As a check of the estimating procedure, it is interesting to note that the State of Oregon, Oregon Covered Employment and payrolls 1974, Employment Division, Dept. of Human Resources, RS Pub. 21 (5-76) reported for Josephine County 21.3 million dollars of direct payroll, and average employees of 2,064 in the lumber and wood products industry during 1974.

Income Generated

Table 2.1.3-25 shows the direct and indirect personal income and employment attributed to logging and processing of timber from BLM-administered lands in the Josephine SYU.

Dependent population estimates were derived by dividing the total (direct and indirect) personal income by the 1974 per capita personal income for Josephine County in 1974 (U.S.D.C., R.E.I.S., 1976).

To estimate employment, the dependent population was multiplied by 0.36, the 1970 ratio of employed persons to the total population in 1970 (U.S. Bureau of Census, 1972) in Grants Pass. (For details of procedures used to estimate employment and population dependence from total personal income, see U.S.D.I. Josephine SYU Planning Area Analysis, January, 1977).

Public Revenues-Timber Harvest

O&C receipts are a highly visible source of county government revenue. In Josephine and Douglas Counties, such receipts substitute for all property tax levies in support of Josephine county government functions. Tables 2.1.3-26 and 27 display sources and destinations of county revenue by broad classes.

The formula for distribution is applied to the total of receipts from all O&C lands in western Oregon. Therefore, individual county

Table 2.1.3-26

Summary of Josephine County Budget for Fiscal Year 1975-76

Item		Amount	Percent
Revenues			
1.	O&C Revenues	$ 5,961,233.59	56.1%
2.	All Other Revenues	4,666,249.86	43.9%
		$10,627,483.45	100.0%
Expenditures			
1.	General Fund	$ 6,468,800.15	61.3%
2.	Road Fund	2,386,095.92	22.6%
3.	Special Funds	1,698,020.16	16.1%
		$10,552,916.23	100.0%

Source: Office of the Josephine County Commission

Table 2.1.3-27

Summary of Douglas County Revenues and Expenditures for Fiscal Year 1975-76 1/

Item		Amount	Present
Revenues			
1.	O&C Revenues	$12,361,664	47.6%
2.	County Property Taxes	1,352,742	5.0%
3.	All other Revenues 2/	12,329,771	47.4%
		$26,044,177	100.0%
Expenditures			
1.	General Fund	$10,727,261	36.0%
2.	Road Fund	8,383,224	28.0%
3.	Other Funds	10,679,327	36.0%
		$29,789,812	100.0%

1/ Information from Douglas County Budget Director

2/ Does not include carry-over surplus of $13,691,358

receipts vary with timber sales and stumpage prices in the aggregate. Variations in the value of timber sales from within a county do not affect local O&C receipts directly. During fiscal year 1976, 9 per cent of total O&C receipts were derived from O&C land under USFS management (U.S.D.I., News Release 77-5, July, 1976).

Social Values and Attitudes

Impact Population

The focus of concern in this section is on those persons in the Josephine Sustained Yield Unit who would comprise the "impact population" if the proposed action were taken. The attitudes and values of tourists, travellers and non-local environmental organizations will not be considered.

The impact population is overwhelmingly composed of rural, non-farm residents. Unemployment is very high, annual earnings are significantly low, and school completion levels are below the State median.

Data in 1975 studies by the DHR (Kohl, 1976) indicates that, in Josephine County, the number of illegitimate births per 100 live births is high (15.2 as compared with a statewide average of 10.1). The divorce rate exceeds the average for the State (7.4 per 1,000, compared with 6.8). Funds for public assistance (supplementary security income, old age assistance, general assistance, and food stamp programs) exceed

statewide average expenditures (Kohl, 1976). There is a higher proportion of persons age 65 and older in the county (15%) than there is in the State as a whole (11%).

The impact population demographic characteristics are: rural, low income, high unemployment, a relatively strong dependence on welfare assistance, and a high proportion of aged persons.

Hypothetically, in such a population, certain attitudes and values would be expected. These include a desire for better employment opportuniti increased income, and an economic and social atmosphere conducive to maintaining family stability and keeping the children at home. The high divorce rate and high proportion of older people indicate that marriages are unstable and that young adults are moving out of the county. It is not unreasonable to expect that the attitudes and values of the impact population would support an increase in timber production and related activities, which would provide employment opportunities. However, this does not appear to be the case.

For example, county residents hold diverse opinions on not only present socioeconomic conditions but also future plans. Attitudes range from supporting a "no change - no growth" position to emphasizing an "aggressive plan" to attract new industries and businesses. (Lowenberg, 1975, p. 61-85).

In a certain sense, such a discrepancy in attitudes, even in an economically depressed area, is not surprising. Those who earn incomes

higher than average, and who can and/or do appreciate living in a region with a low population density, can argue easily for no change or no growth. On the other hand, those who want to work but cannot find jobs and those whose assets would be increased could be expected to support efforts to maintain existing or attract increased employment.

Yet, this clearcut alignment, based on simple economic factors, is not reflected in the impact population. Among the wealthy and controllers of property are those who want increased industrial and business activity; others, within the low income group, are strongly against economic development, even though it may mean jobs and the possibility of an increased standard of living.

Interest Groups

The impact population can be conceived to consist of three interest groups.

The "independents" have settled in Josephine County because they see it as a place with an atmosphere that is conducive to self-expression and creativity and free the sanctions and constraints of an urban area (zoning restrictions, social control mechanisms, etc.).

While some may feel independents is a synonym for alternative culture or hippies, this is not the case. Certainly members of the alternative culture are among independents, but the category is broad enough to include long time residents who came to Josephine County to

achieve the American ideal of life, liberty, and the pursuit of happiness. The category also covers retirees who, on a fixed income, are attracted to the county because it has no sales tax and no county tax (Department of Econ. Development, 1975).

The independents place high value on preservation of existing social and environmental attributes. They appreciate the low population density, esthetic beauty of the region, freedom from pressures to emulate the neighbors, opportunities to cooperate rather than compete with nature.

A second interest group can be called the entrepreneurs. This category, like the independents, might be considered to contain only small business representatives. But this is by no means the case. While businesses from services to manufacturers a included, representatives of various tourist-oriented and environmentalist groups could be included. The enterprenuer is interested in developing or exchanging natural and/or technological resources for personal gain. The store owner, service station owner, motel owner, river tour operator, etc. are people who place high value on tourism. They and those environmentalists whose interests are either directly or indirectly in the economic benefits of leisure-time activities (backpacking, fishing, ff-road vehicle trips, etc. as a break from the 40-hour job) are a mixed group. Some undoubtedly are long-time residents. Others are newcomers, attracted to jobs where they can be close to outdoor recreational opportunities; others are among the huge proportion of newcomers who began arriving in Josephine County during the 1960's and 1970's.

The third interest group can be called the stabilizers. As the Oregon Department of Economic Development (Lowenberg, 1975) observes, Josephine County is in a favorable position for economic development in the State of Oregon. The argument is based on two assumptions. First, the county is a desirable place to live. Secondly, there will be "declines in the coming years in the number of employees the forest products industry and agriculture can sustain," and as a result "the industrial mix ... will need to be expanded and diversified." (Lowenberg 1975, p.1)

Those in the stabilizer category, like those in the other categories, would have a wide range of backgrounds. They could be business representatives, timber industry personnel, real estate dealers, etc. They strongly value continuity, progress, development, and what might be termed free enterprise for the public good.

For example, the DED opposes the no-growth idea by saying that proponents of that position will have growth: "growth in unemployment and growth in welfare payments" (1975, p.4).

Attitudes

Unemployment would be of major concern to the stabilizer group, which would tend to have a two-fold view. First, unemployment is regrettable and should be corrected. However, high unemployment also can be beneficial in that it does draw attention to conditions in the county,

and if presented correctly (e.g., that it reflects a large number of people looking for work) it can serve to convince potential industries and businesses, concerned about labor availability, to seriously consider Josephine County as a location.

Generally, the attitudes of the entrepreneur group toward high unemployment would be mixed. If the entrepreneur was a small business person who depended on seasonal additions to his work force, high unemployment is advantageous. On the other hand, high unemployment rates often are associated with employee instability, reduced need for residential property and construction, employee insubordination, reduced consumer spending, and other behavioral traits.

Those in the independent interest category likely would not be concerned about unemployment rates. Attitudes, if articulated, would be generalized, such as in the statement, "If a person wants but can't find a job here, there are other places."

Attitudes of independents regarding low income generally would parallel those regarding unemployment.

Education, or school completion achievement, would evoke a different set of attitudes. In the DED report, a reflection of the stabilizers, low educational completion levels are considered undesirable. The report contends that Josephine educational facilities are excellent but maintains that a new emphasis on vocational training opportunities

should be launched (1975, p. 66). Attitudes about formal education on the part of the other two interest groups would be relatively inconsequential.

As far as the illegitimate birth rate, divorce rate, and expenditures of public assistance monies are concerned, only the stabilizer interest group would be expected to have substantive positions. And these, much like those involving unemployment and income, basically would be geared to support the rationale for carefully planned, but aggressive, economic development programs.

As has been implied in the preceding discussion, the description of the social attitudes and values of the impact population is not a cut and dried exercise, nor is it something which can be presented in a list in examining the interest grou and the primary values to be expected of each, it should be evident that a major error would be committed in trying to predict, solely on the basis of economic and/or demographic information, what the response/reaction in terms of impacts on the human environment might be if the proposed action is approved.

A broad range of opinions was voiced at public meetings in the JSYU. Some favored increased cutti others supported an immediate cessation of cutting. Some supported a continuation of present practices, others wanted thorough revisions. The increased cut viewpoint was held by people of entirely different age and employment backgrounds. Some were motivated to this viewpoint by concern over the increase of taxes,

others wanted to speed the end of timber industry domination in order to stabilize the economy. (Compare Lowenberg, 1975, p. 37).

Quality of Life

No attempt will be made in this section to describe all the indicators that ordinarily might be included in a discussion of the quality of life. The emphasis will be on describing those aspects that may be affected if the proposed action is approved.

Cost of Living. According to the Oregon Department of Economic Development (DED) "many" residents of Josephine County "believe the cost of living is relatively high" (Lowenberg, 1975, p. 30). This finding is substantiated by data provided by the Oregon Department of Human Resources (Kohl, 1976) and may be illustrated by three items of comparison Josephine County and the State.

	Josephine County	Oregon
1) Per capita income (1974)	$3,977	$5,284
2) Retail sales per capita (1974)	$2,965	$2,713
3) Percent of income used for retail sales	75%	51%

While these figures cover only a portion of the personal income/expenditure spectrum and to some extent reflect an economy based on tourism more heavily than the State average, they illustrate that the cost of living in Josephine County may be high.

Crime. Indexed crime rates for Josephine County in 1975 were substantially lower than the statewide average. The violent crime rate in the county was 188; for the State it was 367. The property crime rate for Josephine County was 4,712; for the State the property crime rate was 5,897. All rates are per 100,000 persons.

Health. One method of ascertaining health is to investigate the number of individuals "at risk," they are those, age 18 through 64, who are partially or completely limited in their ability to carry on their major activity, i.e., work, keep house, go to school (DHR, 1976, p. 18). Comparative figures for county and State are shown below.

		County	State
1.	Physically handicapped	8.4%	8%
2.	Developmentally disabled	1.6%	1.6%
3.	Alcohol and drug dependent	1.7%	2.1%
4.	Personal and interpersonal maladjusted	2.3%	2.3%

Population Density. In 1976 the county-wide population density was approximately 29 per square mile (Portland State Univ., C.R.R.C., 1976). According to The Amundson Associates, (S.O.F.C.U., December 1974), population density based on county census divisions varied from a low of about .5 persons to a high, in Grants Pass of about 1800 persons per square mile.

based on county census divisions varied from a low of about .5 persons to a high, in Grants Pass of about 1800 persons per square mile.

In other words, crowding is not a problem. Isolation, on the other hand, is not a significant factor in the population distribution. of These coupled observations constitute a very favorable rating population density.

Taxation. As the Oregon Department of Economic Development submits (1975, p. 63), "there is no State sales tax and in Josephine County ... no county tax." The assessed valorem tax per $1,000 of assessed value was $17.53 in 1974. This compares to a statewide average rate of $24.18. The low tax rate is ambiguous as an indicator of the quality of life, since it says nothing about the availability of public services.

Other. Such indicators of the quality of life as educational facilities and opportunities, health care facilities and medical personnel, water and air quality, etc. are regarded as good to excellent by the DED (1975, p. 14 and following). However, due to the fact that these would not be affected directly by the proposed action, they will not be evaluated in this environmental statement.

Existing Land Use

This, the final section describing the existing environment, addresses land use. The total area of the Josephine SYU includes approximately 856,844 acres, of which 425,720 acres or 49.7 percent are public lands (an exact breakdown of land jurisdiction within the JSYU is shown in Table 1-1). These 425,720 acres constitute the total base on which managment decisions to allocate the land for multiple use purposes are made.

Long before it was codified in the Federal Land Policy and Management Act of 1976, BLM ascribed to the principle of multiple use. The Bureau planning system previously described is the mechanism for deriving that combination of land and resource commitments which will best meet the present and future needs of the American people.

Forest Management

Forest management, including timber harvest, is the dominant land use in JSYU. The present allowable cut provides for the harvest of 146 million board feet (Scribner) per year (see Section 1.2.5). The commercial forest land base upon which that level of cut was determined amounted to 334,500 acres. The proposed action identifies a commercial forest land base of 229,310 acres and an allowable cut of 90 million board feet.

Comparison of the present allowable cut with the proposed action discloses the 1970 commercial forest land base to be 79 per cent of all public lands within JSYU, while the proposal establishes a commercial forest base of 54 per cent of the total public lands.

Annual Timber Harvest

The current timber management program was adopted in 1971 and is subject to the principles of multiple use, sustained yield, and environmental quality. Annual timber sale plans contain site specific information on individual proposed timber sales. Information listed in an annual plan includes the location of the proposed sale, approximate volume to be harvested, cutting practices to be followed, method of logging, road construction and access requirements, special contractual provisions and other relevant data. Table 2.1.4-1 summarizes data on timber sales in JSYU under the current allowable cut plan.

Forest Development

The allowable cut plan recognizes a necessity for prompt regeneration of areas receiving final harvest cut. Annual programs for artificial regeneration, stand improvement, and site conversion are among the silvicultural practices employed to achieve full productivity from commercial forest lands. Table 2.1.4-2 shows the acreage by practice which has been treated during the present allowable cut plan period.

Table 2.1.4-1

Timber Sales: Josephine SYU

Fiscal Year	Volume (M.bd.ft)	Acres Involved Clear Cut	Partial Cut
1972	146,151	848	9,345
1973	154,579	1019	10,280
1974	140,715	650	9,533
1975	143,126	677	8,957
1976[1]	174,996	965	14,945
1977[2]	146,000		

1 15 month fiscal year
2 Planned for fiscal year, no breakdown of cutting practices

Sources: BLM Monthly Timber Sale Summaries

Table 2.1.4-2

Forest Development: Josephine S.Y.U.

Fiscal Year	Acres Treated Scarification	Seeding	Planting	Herbicide	PCT
1971			1321		
1972			1948		23
1973			1226		59
1974	116		1220		
1975			787		
1976[1]	15		681	603	
1977[2]	130	64[3]	1720	419	300

1 15 month fiscal year
2 Planned for fiscal year
3 40 acres seeding with genetically superior sugar pine

Source: Medford District, BLM

Disruptive Factors

The timber management program in the Josephine SYU is influenced and can be altered by certain natural or man-caused phenomena. An annual timber sale plan is designed with the normal situation in mind. Occasionally, insect populations may grow to epidemic proportions or a single catastrophic event, such as a fire or windstorm of major proportions, may occur. When this happens changes in the timber harvest plan may result. Changes could take on the form of 1) selection of different methods of harvesting timber, 2) accelerating the annual cut over a period of time, 3) altering the locations of timber harvest and/or marketing areas, or 4) creating the necessity for unusual rehabilitation programs in the area.

Several catagories of events can disrupt normal situation planning. A brief discussion of individual factors that could result in a modification of the timber management program follows.

Wildfire

As outlined in Table 2.1.1-16 wildfires have burned approximately 3400 acres in the JSYU since 1966. Most of these 314 fires were insignificant in that, with the exception of the Quail Creek Fire in 1970, they averaged less than 4 acres in size.

The Quail Creek Fire however, burned over some 2,910 acres and caused a restructuring of the JSYU timber management program, from the

standpoint of salvage logging and rehabilitation requirements of the area, which lasted for several years.

As fire suppression and pre-suppression measures become more sophisticated the chances of a major conflagration occurring in the future become less likely. The possibility does exist however. The Oxbow fire of 1966 burned more than 40,000 acres and affected the timber management program of three BLM districts.

Insects

Endemic infestations of Douglas-fir bark beetles have always existed in varying intensities throughout the Josephine SYU. These infestations have a tendency to periodically reach epidemic proportions in localized areas. Causative factors include fires, windstorms, periods of severe drought, snow break, and poor cutting and/or utilization practices.

Past epidemics have produced localized patchworks of small, even-aged stands of second-growth timber. In recent years however, insect populations have been held in balance primarily due to the development of major road systems. This has allowed harvesting of infested areas before epidemic conditions develop.

Forest Diseases

Decay organisms affecting roots and/or heartwood of forest trees cause the most significant loss of wood volume due to disease in the

Josephine SYU. Heart rot is especially prevalent in old-growth trees. The timber management program takes this into account and assigns a high priority to the harvest of these decadent, high-risk trees. As these trees are harvested the incidence of disease and the resulting loss of volume due to these decay producing organisms will diminish accordingly.

Windstorms

Periodic winter storms, accompanied by high winds, either break or uproot trees throughout the area on a continuous basis. Normally, volume losses can be held to a minimum by including individual trees or small groups of trees with the planned harvest of timber in the area.

Occasionally however, extremely high winds, such as those created in the Columbus Day storm of 1962, can cause an abnormal blowdown situation which could completely disrupt the timber management program for a period of several years. Prompt salvage is necessary to avoid buildup of destructive insect populations in damaged timber.

Trespass

Unauthorized cutting and/or removal of forest products, i.e., timber, Christmas trees, cedar shake bolts or posts, and firewood, occurs with varying degrees of regularity throughout the Josephine SYU. As the value of these products (especially high-quality cedar) increases, the incidence of willful trespass also increases.

Compounding the problem is the fact that, in recent years the high cost of heating fuel has resulted in a tremendous increase in the demand for firewood. Quite often, high-quality sawtimber is cut into firewood lengths and removed by otherwise honest, law-abiding citizens who are completely unware of its value.

If this trend continues it could have a significant effect on the overall timber management program in the JSYU.

Agriculture and Grazing

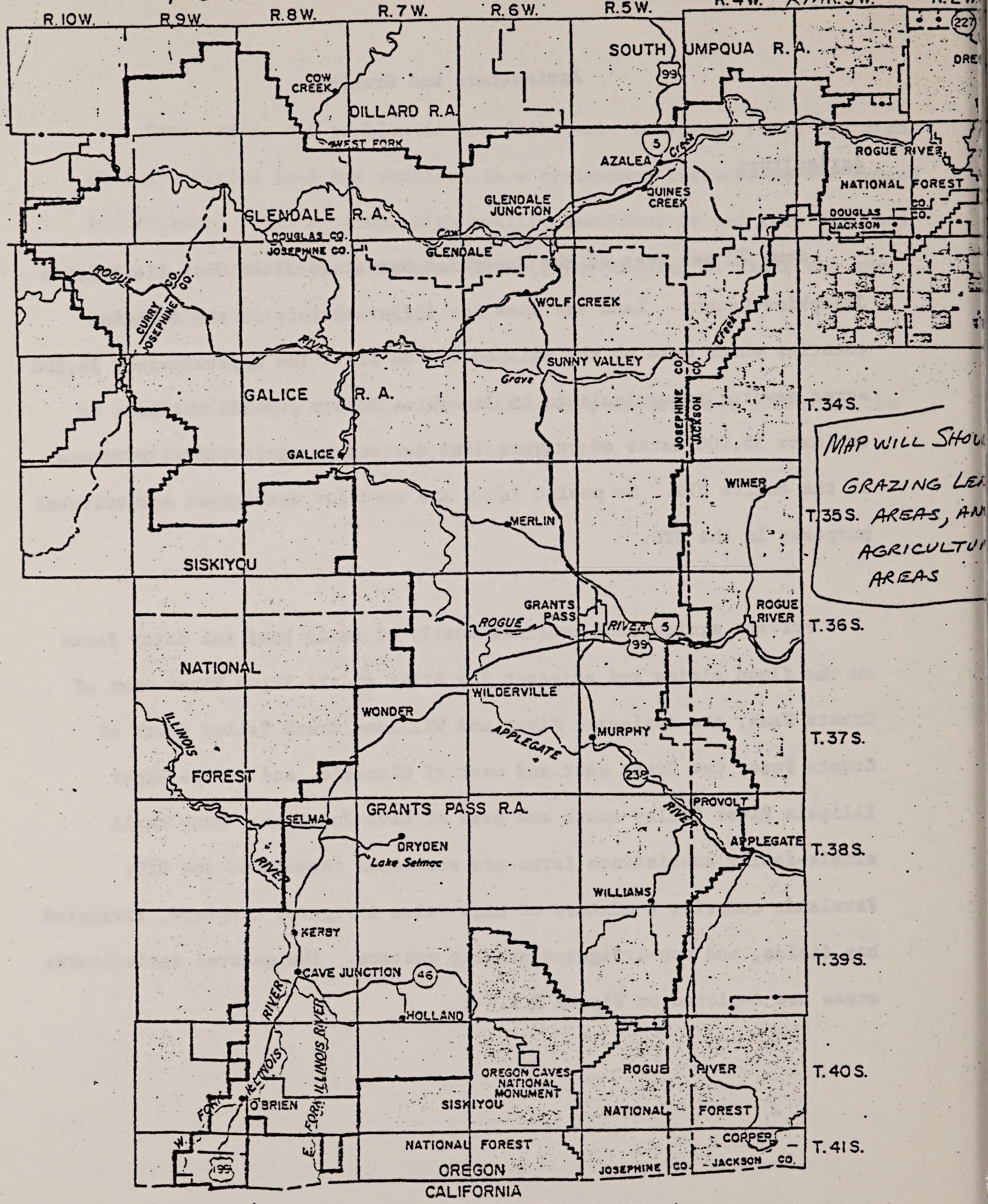
Agriculture

Some 70 per cent of the Josephine Sustained Yield Unit lies within Josephine County. Land use does not differ sharply in the adjacent counties which make up the balance of the SYU. The approximately 38,500 acres devoted to agriculture in Josephine County provide the base to estimate 55,000 acres of private land devoted to agricultural purposes in the entire SYU. No public lands are used for authorized agricultural purposes in the SYU.

Private agriculture consists mostly of small beef and dairy farms on the flood plains and adjacent low hills of the Rogue River west of Grants Pass, the Applegate River and Williams Creek Valley south of Grants Pass, Cow Creek east and west of Glendale, and in the Upper Illinois River Valley south and east of Cave Junction. Many small single-family subsistence farms are scattered throughout the SYU. Farmlands comprise a mixture of high value irrigated cropland, irrigated hay fields, and non-irrigated grazing pasture. The general agricultural areas are depicted on Figure 2.1.4-1.

FIGURE 2.1.4-1

3/14/77 KM



JOSEPHINE SUSTAINED YIELD UNIT

County Boundary	National Forest, Forest Service
National Forest Boundary	Public Lands, BLM
Master Unit Boundary	SUSTAINED YIELD UNIT BOUNDA
Resource Area Boundary	

SCALE

MILES 10 5 0 10 20

Grazing on National Resource Lands

Livestock grazing on BLM-administered lands in the Josephine Sustained Yield Unit is authorized by Section 15 of the Taylor Grazing Act of June 28, 1934. Grazing leases specifically on revested Oregon and California Railroad lands are authorized by Section 4 of the Act of August 28, 1937, but only when they do not interfere with production of timber or other purposes specified in Section 1 of the Act. Qualifications and preference order for obtaining grazing privileges are set forth in Title 43, Part 4121 of the Code of Federal Regulations.

There are at present nine grazing leases covering 9,399 acres of public lands. All are in Josephine County (see Figure 2.1.4-1).

Due to a combinatic f liver flukes, lower manpower requirements, and lessee preference, cattle are the only class of livestock using the public lands at present. The parasitic liver flukes cause high mortality in sheep, while cattle can tolerate infection (Siegmund, et.al., 1967) At least one of the cattle lease areas was grazed by sheep in the past. Losses due to the flukes made it uneconomical to continue as a sheep operation. The land is vegetatively and topographically better suited to sheep or goat grazing.

The unit by which livestock forage on federal lands is quantified for production and use is the animal unit month (AUM). An AUM is defined as the amount of forage (of any combination of vegetative species)

necessary for the subsistence, in a healthy state, of one mature cow (and calf under 6 months) for a period of one month. An animal unit is one mature cow, one horse, five sheep, six deer, or equivalent numbers of other herbivorous species. Authorized grazing use is displayed in Table 2.1.4-3.

Most of the lessees are small farmers who produce irrigated hay on their own land, generally only enough for winter feeding. They are dependent on public lands and Forest Service lands for spring and summer forage for their cattle.

Most land in the grazing allotments lies between 2,000 and 3,000 feet in elevation. Much of the terrain is steep and covered by dense brush stands. Grazing is not allowed on public lands before April 1, and sometimes not before April 15, due to wet soil conditions in the early spring. The grasses normally dry up around July 15 after completing their growth cycle. Cattle tend to concentrate on the better grass, shrub, and wet meadow areas. Overuse to some extent is recognized in these areas. Water is available to livestock from surface sources and springs, and the approximate volume used by livestock on public lands is 0.5 acre feet per year.

Neither range surveys nor conditon and trend studies have been conducted on the grazing leases. District personnel conclude by visual observation that grazing values are not high. The high percentage of

TABLE 2.1.4-3.

GRAZING LEASES

LEASE NAME & NO.	NO. ACRES FEDERAL LAND O&C	PD	BR 1/	ALLOWABLE USE (AUMS) 2/ O&C	PD	BR 1/	NORMAL SEASON OF USE	FORAGE PRODUCTION (AUM'S) 2,3/	WATER REQUIRED (1,000 gl) 4/
Gillaspey 301	591	589		33	37		4/16-9/15	70	21.0
Rich 302	280			30			4/1-8/31	30	9.0
Johnson 303	13	17		4	4		4/16-5/15	8	2.4
Iverson 308	844	321		56	21		4/1-6/15 10/16-12/15	77	22.1
Sauer 309	1552	120		86	10		4/16-7/15	96	28.8
Pfohl 310	15			3			11/1-2/29	3	.9
Duval 312	1447	2763	247	48		93	4/1-6/31	150	45.0
Freeborn 315	560			17			4/20-7/31	17	5.1
Brown 316	40			5			4/1-5/30 9/1-10/15	5	1.5
SUB TOTAL	5342	3810	247	282	72	93		456	135.8
TOTAL		9399			447			456	135.8

1/ Bureau of Reclamation withdrawal - Grazing Administered by BLM

2/ AUM = Animal Unit Month = Amount of forage necessary to graze one animal unit for one month; an animal unit being one mature cow (and calf under six months) or the equivalent, e.g., five sheep, one horse, six deer, etc.

3/ Estimated

4/ Based on 300gl/AUM

intermingled private lands and the absence of exchange-of-use agreements make regulation of use difficult and preclude the development of regular allotment management plans (AMPs). Consequently, there are no AMPs in effect in the Josephine unit. However, there is a Soil Conservation Service plan on one lease area, and an Interagency Coordinated Resource Plan written on the combined areas of two other leases. These plans cover the majority of the public lands being grazed, with the remainder administered according to the stipulations of each lease.

There are no grazing management facilities on the lease areas except for a few unrecorded drift fences to keep livestock out of private lands. Two operators trail between private land, public lands, and Forest Service lands. Most trail grazing occurs along county road rights-of-way.

Trespass on public lands of goats, horses, and cattle belonging to people living on unfenced private property adjacent to public lands is a general problem in the Josephine unit. The problem is difficult to cope with because of lack of manpower to detect trespass and enforce regulations and lack of identifying brands on the livestock.

There are no wild horses or burros in the Josephine area. Any horses or burros found on public lands are either estray or in trespass.

Mining

Mining activities in the Josephine SYU are primarily in the two categories of locatable minerals and saleable minerals. "Locatable" means minerals that are subject to claim under provisions of the Mining Law of 1872, as amended. Mineral materials subject to location in the SYU have included gold, silver, copper, chromium, mercury, manganese, molyboenum, lead, and zinc. Saleable minerals have included quarry materials (sand, gravel, and crushed rock).

The O&C lands are subject to entry under the United States Mining Laws as provided by the Act of April 8, 1948 (62 Stat. 162) (3821.1a/43 CFR). The act of October 23, 1976 (Public Law 94-579), known as the Federal Land Policy and Management Act of 1976, requires the owner of an unpatented lode or placer mining claim to file at the office where the claim was recorded a notice of intention to hold the mining claim. Also, the claim must be registered in the office of the Bureau of Land Management as designated by the Secretary of the Interior. Failure to file such notices within the time frame allowed will be interpreted as abandonment of the calim. Public Law 94-579 covers all lands administered by the BLM.

There are no known leasable minerals within the Josephine SYU. Leasable minerals include oil, gas, and other designated minerals.

Saleable quarry products account for the majority of the mineral activities in the SYU. Crushed rock and gravel are used extensively in the construction and surfacing of roads associated with the Timber

Management Program. Building and maintaining roads requires about 215,000 cubic yards per year in the SYU. This material is obtained under contract sale from specified sites administered by the BLM. No private damand for saleable materials exists presently in the SYU; private lands supply all demand for aggregate, sand, and road surfacing material.

Transportation Networks

Public transportation systems in the Josephine Sustained Yield Unit are limited by the rugged physical relief and low-to-moderate population density. Although major highways are few, the secondary ground transportation network is extensive, providing access primarily for logging and forestry practices of public land management agencies and the timber industry.

Figure 2.1.4-2 shows airstrips, major highways and roads, railway lines, and the Rogue River Trail. Detailed maps showing the location of BLM, county and some private roads are on file in each resource area office of the Medford District.

Ground Transportation

Highways

Interstate Highway 5 serves the west coast from Mexico to Canada, paralleling and sometimes coinciding with the old U.S. Highway 99. From Medford, southeast of the sustained yield unit, it proceeds westerly to Grants Pass and then northerly to Roseburg and Portland. Average traffic count on I-5 seven miles north of Grants Pass was 10,380 vehicles per day in 1975 (Traffic Volume Tables for 1975, p. 218).

FIGURE 2.1.4.-2

3/14/77 KM

MAP WILL SHOW: FEDERAL + STATE HIGHWAYS, RAILROAD, AIRSTRIPS, AND ROGUE RIVER TRAIL.

JOSEPHINE SUSTAINED YIELD UNIT

County Boundary
National Forest Boundary
Master Unit Boundary
Resource Area Boundary
National Forest, Forest Service
Public Lands, BLM
SUSTAINED YIELD UNIT BOUNDARY

SCALE

MILES 10 5 0 10 20

U.S. Highway 199 runs from Grants Pass southwest through Cave Junction into California. Average traffic count on U.S. 199, at a point one mile north of the California-Oregon State line, was 1,965 vehicles per day in 1975 (Ibid.).

State Highway 46 runs eastward from Cave Junction some 20 miles to Oregon Caves National Monument. Average traffic count on State Highway 46, at a point about 2.5 miles east of Cave Junction, was 960 vehicles per day in 1975 (Ibid., p. 44).

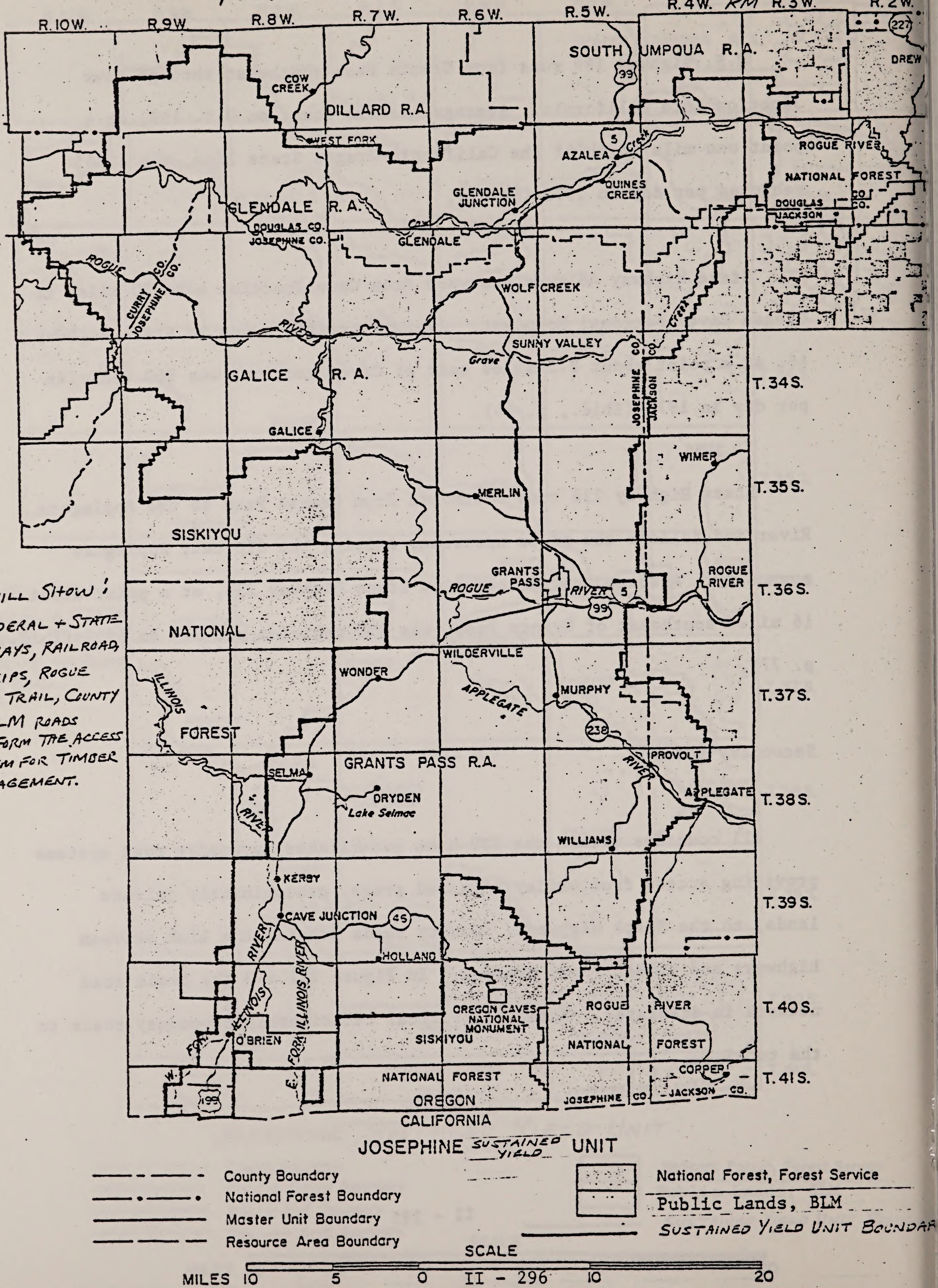
State Highway 238 runs southward from Grants Pass to the Applegate River and follows the river upstream, exiting the SYU near Applegate community. Average traffic count on State Highway 238, at a point about 16 miles southeast of Grants Pass, was 800 vehicles per day in 1975 (Ibid., p. 77).

Secondary Roads

All counties within the SYU have established extensive road systems providing access from valley situated areas, predominantly private lands, to the State highways. County roads provide the link between highways and timber roads systems. In Figure 2.1.4-3 the basic road network is displayed. Note the critical relationship of county roads to the total.

FIGURE 2.1.4-3

2.1.4.4 - 3a
3/14/77 KM



MAP WILL SHOW: FEDERAL + STATE HIGHWAYS, RAILROAD, AIRSTRIPS, ROGUE RIVER TRAIL, COUNTY AND BLM ROADS THAT FORM THE ACCESS SYSTEM FOR TIMBER MANAGEMENT.

BLM Roads

In the early days of timber harvesting on government lands in the Josephine SYU, purchasers were responsible for obtaining access to sale tracts. Most roads were poorly designed and utilized temporary easements obtained from private landowners. Roads were not located to facilitate subsequent sales. When logging was completed, the government did not have legal access to the area, and the roads were left to deteriorate. Many of these roads have since been rebuilt to modern standards, but some remain as a contributing factor to erosion and regrowth problems.

Around 1950, the BLM started long-range planning of timber sales, including projection of road locations to provide access to entire drainages. To provide equal opportunity for all potential timber purchasers, policy was established to provide for legal access to all timber tracts offered for sale. Perpetual exclusive easements allowing BLM control are now obtained from owners whose lands are crossed by roads. Exclusive easements for BLM roads across private lands are of sufficient width to accommodate the proposed road design.

In the 1960's, BLM began entering into perpetual right-of-way and road-use agreements with other governmental agencies, timber companies, and individual land owners. Agreements cover larger areas of land and reduce the number of individual easements required. Many agreements stipulate specific maintenance responsibility. An agreement has two parts: the agreement, which delineates the rights of the government,

and the permit, which delineates the rights of the second party. Site specific documents, under the umbrella of an overall agreement, provide for road use or construction by either party with mutual approval. The road use agreements now in effect within JSYU are listed in Table 2.1.4-4.

The BLM-administered roads are constructed to standards necessary to carry logging traffic and equipment for logging activities. Mainline roads, referred to as access roads, have better grade and alignment, and their surfaces are often treated with gravel or bituminous material. Surface widths range from 17 to 24 feet. Tributary feeder and spur roads are constructed narrower and steeper than the mainlines, with pit-run (unprocessed) rock or natural dirt surfaces 12 to 17 feet wide.

Major access roads have been constructed with appropriated funds under Federal Highway Administration (FHWA) contracts. These roads are listed by name and number in Table 2.1.4-5 and shown on Figure 2.1.4-3. Until recently FHWA also performed a road maintenance function under contract to BLM for portions of the road system. On October 1, 1976, BLM assumed the maintenance role directly and absorbed FHWA personnel and equipment.

Maintenance of the BLM-administered road system is accomplished directly by BLM or through maintenance provisions of road use agreements, right-of-way permits, and timber sale contracts. Annual road maintenance plans are prepared and updated as necessary, based on anticipated log

Table 2.1.4-4

Road Use Agreements

Agreement Number	Permittee	Effective Date
BLM/Oregon State	State of Oregon	1/6/60
M-605	The Robert Dollar Co.	3/13/61
R-656	Longview Fibre Co.	4/3/62
M-700	Douglas Veneer-Roseburg Lmbr	5/17/63
R-751	Douglas Veneer-Roseburg Lmbr	7/7/64
M-824; R-824	C & D Lumber	1/6/67
M-870	Rogue Valley Trees-Edwin C. Smith	8/26/68
BLM/USFS	U.S. Forest Service	7/24/69
M-887	The Robert Dollar Co.	11/17/69
M-868	Giustina Bros.	1/4/71
M-660	Boise-Cascade Corp.	8/25/61
M-1006	Mountain Fir Lumber Co.	3/27/74

Table 2.1.4-5

Major Access Roads[1/]

Name and Designation[2/]	Length (miles)[3/]
Snow Creek Road (32-3-5)	7.5
Cow Creek Road (33-7-2)	10.9
Grave Creek Road (34-5-10)	14.6
Whiskey Creek Road (33-8-26)	5.0
Bobby Creek Road (32-9-14.4)	6.5
Deer Creek Road (38-7-13)	8.9
Powell Creek Road (38-5-15)	4.8
Mt. Reubin Road (34-8-1)	4.4
Almeda Road (34-8-13)	3.6
Galice Access Road (34-5-36)	23.1
Cedar Flats Road (39-5-6)	9.0
Kelsey-Mule Road (32-8-31)	10.3
Dutch Henry Road (31-7-19.3)	8.5
West Fork Cow Creek Road (32-8-1.1)	9.5

1/ The term "access roads", as normally employed refers to those roads constructed with appropriated funds to gain access to large blocks of harvestable timber.

2/ Numerical designations are applied to all elements of the BLM transportation system for record keeping purposes.

3/ In some cases access raods (appropriated fund construction) have been extended by construction requirements of timber sale contracts. The indicated length includes both funding methods.

hauling schedules of purchasers and permittees. Therefore, some roads get very little or infrequent repair, while others are maintained on a regular basis.

The BLM road system in the Josephine SYU contains approximately 1900 miles of road including 142 miles of jeep (4 wheel drive) road. Of these, 1126 miles are pit-run rock surface, 483 miles are crushed gravel surface, and 149 miles are bituminous surface. Another 110 miles of road are being constructed or reconstructed annually. Approximately 13,000 acres of land classified for intensive forest management presently are included in roads and therefore removed from the allowable cut base.

Other Elements

The only regularly maintained foot trail in the unit is the Rogue River Trail. It is 24.3 miles in length and maintained to a 30 inch treadway. It is in good condition and closed to motorized vehicles. Numerous other old forest trails exist in varying condition.

Off road vehicles, including motorcycles, use jeep trails, skid trails, fire breaks, and other roadless but accessible areas in recreational pursuits. (See Recreation Section and Figure 2.1.3-4).

Air Transportation

Josephine County maintains a county airport at Merlin, four miles north of Grants Pass. The 75-by-4000 foot asphalt-surfaced runway is in good condition, lighted, and has a 10-pound single-wheel weight restriction.

The Illinois Valley Airport, operated in conjunction with the U.S. Forest Service smokejumper base, is three miles south of Cave Junction on U.S. Highway 199. It has an asphalt surface and can be lighted on request. USFS has maintenance responsibility for the 75-by-5200 foot runway, which has a restriction of 20,000 pounds wheel weight.

The Calvert Peak airstrip was constructed by the BLM about 18 miles west of the town of Glendale. Its 3000-foot gravel-surfaced runway is in fair condition and maintained by BLM on a periodic basis, primarily used as an emergency fire suppression facility. It is not open to the public.

Hughes Airwest and United Airlines offer direct and connecting commercial flights out of the Medford Airport, about 25 miles east of Grants Pass. A commuter airline, Executive Flight Service, Inc., serves Roseburg, 60 miles north of Grants Pass. Air charter service is available at Roseburg, Medford, and Josephine County Airport near Merlin.

Commercial Ground Transportation

Bus Service

Commercial buses traverse the Josephine area from the north down Interstate Highway 5 through Grants Pass on to California, and from Grants Pass down US Highway 199 to California (Loy, et. al. 1976).

Railroads

The Southern Pacific Railroad comes from California up through Medford, following the basic route of Interstate 5 to Grants Pass, where it meanders northward to the community of Wolf Creek, and from there northwest through Glendale on its way to Roseburg. The railroad provides commercial freight service but does not carry passengers (Loy, et. al. 1976).

Water Transportation

There is no commercial transport of goods via water within the SYU. Several of the larger streams were used for that purpose in earlier days, however.

Today several of the larger streams are used as travel routes during the recreational season. Most noted for this use is the Rogue River for its entire length within the unit. Use figures for that portion of the Rogue within the wild and scenic area are given in the recreation section of this chapter.

Commercial

Other streams seasonally used for recreation-oriented water transportation include the Applegate and Illinois Rivers. Late summer use is often affected by irrigation drawdown which makes them too shallow to traverse.

Utility Systems

There are approximately 66 miles of rights-of-way for utility systems on public lands in the Josephine SYU. The right-of-way grants vary in quantity of acreage affected, because of variation in length and width of each grant. For instance, a 100 foot wide right-of-way for one mile involves about 12 acres, while a grant for a 200 foot wide right-of-way for one mile encloses about 25 acres. They preclude surface management within their boundaries and necessitate special provisions for timber harvesting in their immediate areas. Additional road rights-of-way over public lands are sometimes required for access and maintenance of facilities. There are designated utility corridors in the SYU where all future major utility transmission lines are to be located. These corridors are shown on Figure 2.1.4-4.

Power Transmission Lines

Many electrical power lines follow existing roads which provide access to small communities and homes.

Cross-country high voltage lines connect or exist from Russell Creek to Upper Grave Creek, from Upper Wolf Creek to King Mountain, and from Merlin to the Alameda Mine Area. A high voltage line comes into Glendale from north of the SYU and continues southward through Wolf

MAP WILL SHOW:

RIGHTS-OF-WAY FOR TRANSMISSIC LINES, COMMUNICAT. SITES, AND PIPELINES.

UTILITY CORRIDORS

JOSEPHINE SUSTAINED YIELD UNIT

County Boundary
National Forest Boundary
Master Unit Boundary
Resource Area Boundary

National Forest, Forest Service
Public Lands, BLM
SUSTAINED YIELD UNIT BOUNDARY

SCALE

MILES 10 5 0 10 20

Creek and Pleasant Valley to the Grants Pass Area. Two lines run from Grants Pass southwest to Cave Junction, one along US 199, and the other cross-country into US 199 about four miles north of Cave Junction. Three major lines run southward from Cave Junction out of the SYU and into California. Figure 2.1.4-4 shows the transmission line rights-of-way and designated utility corridors across public lands, and Figure 2.1.4-5 shows the relationship of transmission lines in the SYU to the electrical transmission grid for the state of Oregon.

Communications

Telephone lines generally follow roads for access to communities and homes. A telephone-telegraph line follows the Southern Pacific Railroad tracks through the SYU.

There are six communication sites on public lands within the SYU. Table 2.1.4-6 lists these sites and gives the parties using them, their locations, and the types of use. Figure 2.1.4-4 shows the location of the communication sites.

Pipelines

Several rights-of-way for water facilities have been granted in the Josephine SYU. Most applications are for pipeline rights-of-way across public lands to provide culinary water to private dwellings. The point where water is taken or diverted from the stream is generally on public

3/14/77 KM

TRANSMISSION GRID

[redacted]

MAP WILL SHOW: JOSEPHINE SYU SUPERIMPOSED TO SHOW RELATIONSHIP OF ELECTRICAL TRANSMISSION LINES IN THE SYU TO THE GRID FOR OREGON. WILL SHOW WHOLE STATE

SOURCE: U. S. DE[P]
BONNEVILLE POWE[R]

FIGURE 2.IV.4 3075

lands, upstream from the dwelling. The exact number of applications has not been tabulated. Unauthorized use of public lands for water facilities is a problem: see Section 2.1.4.5.4.4. No ditches or canals have been authorized in the SYU.

A high pressure gas pipeline runs from north to south through the SYU about a mile east of Interstate 5. See Figure 2.1.4-4.

TABLE 2.1.4-6
COMMUNICATION SITES

User	Serial No.	Remarks
	Baldy Mountain Site T. 36 S., R. 5 W., Sec. 27	
Southern Oregon Broadcasting Co.	OR 04928	Microwave Translator
	Rock Point Site T. 39 S., R. 5 W., Sec. 21	
Rock Point Translator, Inc.	OR 2135	TV Translator
	Sexton Mountain Site T. 34 S., R. 6 W., Sec. 24,	
Environmental Science Services Admin.: Weather Bureau Salt Lake City, Utah	OR 016772	No radio equip. All communications by land lines
Oregon State Forestry Department Salem, Oregon		Two-way Radio (Forest protection lookout tower)
Oregon State Highway Department/ State Police Salem, Oregon	OR 06247	Two-way Radio (Joint use permit)
U.S. Forest Service Portland, Oregon	OR 012011	Two-way Radio (Siskiyou N.F.)
Josephine Co. Road Dept./Sheriff Dept.; Court House Grants Pass, Oregon	OR 3413	Two-way Radio (Joint use permit)
Pacific Northwest Bell Tele. Co. Portland, Oregon	OR 015714	Two-way Radio
Southern Pacific Company San Francisco, California	OR 3446	Microwave
	Beacon Hill Site T. 36 S., R. 5 W.	
Oregon State Forestry Department Central Point, Oregon	OR 13999 (Application)	Telephone Remote Relay

TABLE 2.1.4-6 (continued)

User	Serial No.	Remarks
	Curry Ridge Site T. 34 S., R. 9 W., Sec 6	
Bureau of Land Management Portland, Oregon		Two-way Radio Repeater
	King Mountain Site T. 33 S., R. 5 S., Sec. 24	
Oregon State Forestry Dept. Salem, Oregon	OR 013199	Two-way Radio
Southern Oregon Timber Ind. Assoc. Medford, Oregon	OR 018406	Two-way Radio
U.S. Forest Service Portland, Oregon	OR 2779	Two-way Radio
Southern Pacific Company San Francisco, California	OR 5471	Microwave
Federal Bureau of Investigation Portland, Oregon	OR 5500	Two-way Radio
Pacific Coast Inc.	OR 5595	Two-way Radio
Bureau of Land Management Portland, Oregon	OR 013199	Two-way Radio Repeater

Recreation

All of the public lands within the Josephine SYU are available for dispersed recreation. Over 11,000 acres, mostly along the Rogue River, are specifically utilized or withdrawn for recreation purposes. Table 2.1.4-7 summarizes these recreation lands.

Rogue River Lands

Two partially overlapping recreational withdrawals exist along the Rogue River downstream from the confluence of the Applegate River.

The Wild and Scenic Rivers Act, Public Law 90-542, (1968) has withdrawn approximately 9,800 acres of public lands within one-quarter mile of the banks of the Rogue River for the preservation of scenic, recreational, geologic, fish and wildlife, historic, cultural, or other scenic values. This withdrawal segregates the public lands from entry, sale, or other disposition under the public land laws and the mining and mineral leasing laws.

Public Land Order 1726 (1958) withdrew certain public lands adjacent to the Rogue River and its tributaries to be reserved and set aside for the protection and preservation of scenic and recreation areas. These lands are withdrawn from all forms of entry under the public land laws including mining but not mineral leasing laws nor the Materials Sales Act of July 31, 1947, as amended. Within the Josephine SYU, this withdrawal includes about 10,700 acres. Tucker Flat Campground is located within this withdrawal.

Table 2.1.4-7

Recreation Lands, JSYU

Lands Managed by BLM

Site	Acres	Manager	Authority
Rogue River	10,700	BLM	PLO 1726
Rogue Wild and Scenic River	9,800	BLM	PL 90-542
Sub Total	10,700*		
Shady Branch C. G.	40	BLM	PLO 3869
Deer Creek C. G.	40	BLM	"
Cold Springs C. G.	70	BLM	"
Sub Total	150		

Total BLM 10,850 acres

Lands Leased to Other Governmental Units

Site	Acres	Lessee	Authority
Argo Recreation Site	82.7	Josephine County	Recreation and Public Purposes Act (R&PP)
Carpenter's Island	4.0	" "	"
Cathedral Hills	400.0	" "	"
Grave Creek Boat Ramp	22.8	" "	"
Hellgate Park	46.7	" "	"
Lake Selmac	48.5	" "	"
Rand Recreation Area	26.0	" "	"
Reuben Recreation Area	40.	" "	"
Highland Park	41.8	City of Grants Pass	"
Illinois River Forks State Park	80	State of Oregon	"
Sub Total	792.5		

Lands Patented to Other Governmental Units

Site	Acres	Patentee	Authority
Ennis Riffle	50.	Josephine County	R&PP Act
Griffin Park	.3	" "	"
Rough and Ready State Wayside	20.5	State of Oregon	
Sub Total	73.5		

Total Recreation Land 11,716

*These two withdrawals partially overlap: to add them would result in double counting, therefore the 10,700 acre figure is used.

Source: BLM State Office; Medford District Office

Other BLM Managed Recreation Lands

Shady Branch Campground, Deer Creek Campground and Cold Springs Campground were withdrawn in 1965 by Public Land Order 3869 from appropriation under the public land laws including the mining laws, but not mineral leasing laws, and reserved for public recreation.

Public Lands Leased or Patented to Other Governmental Units.

Both leases and patents can be issued under the Recreation and Public Purposes Act of 1954. In the Josephine SYU, nine sites are leased to other governmental bodies for recreation purposes. Three other sites are patented, with reversionary clauses should the sites not be utilized for recreation. Patented lands are not considered to be public lands.

Miscellaneous Land Uses and Designations

There are several administrative procedures by which the BLM may authorize secondary, or specialized, use of national resource lands. Right-of-way permits are one such means. They are generally used to authorize roads, highways, utility lines, communication sites and lines, and pipelines. These are discussed under Section 2.1.4.4, Transportation Networks.

Withdrawals segregate areas of NRL for specific purposes such as for power projects, land or water reclamation, or recreation projects. Withdrawals also may segregate areas from the operation of specific public land laws, e.g., an area may be withdrawn from the Mining Law of 1872 in order to preclude prospecting on a developed recreation area.

Leases are authorized in certain cases. The types of leases being used in the Josephine SYU are Recreation and Public Purposes Leases (R&PP), Small Tract Leases, Mining Claim Occupancy Act Leases, Special Land Use Permits, and Section 15 Grazing Leases. Grazing leases are discussed in Section 2.1.4.2.

Designations to preserve areas of public lands for special uses, such as Research Natural Areas, are provided for by law. Such designations have no affect upon established use or management of the sites involved.

Other "one-time" authorizations to use resources such as firewood, fence posts, building stone, gravel, or topsoil are on a short-term permit basis. Fees consonant with the fair market value of the resource are determined by an appraisal.

Research Natural Areas

Research Natural Areas are established and maintained for research and education and cannot be used in a manner which violates this primary intent. When necessary, the general public can be excluded or restricted in order to preserve the area.

The 210-acre Brewer Spruce Research Natural Area was established on January 29, 1965. The summit of Little Grayback Peak (elevation 5,445) and Rabbit Lake (a shallow, 0.5 acre pond) are within the designated area. The acreage has been set aside to protect an unusual association of plant species. Ten different species of conifers, including large amounts of Brewer spruce, are found here. The extensive brushfields are another outstanding feature. Sixty per cent is forest, 25 per cent is brushfield, and the remainder is bare rock outcrops and talus (Dyrness, 1972). No facilities have been provided within the Brewer Spruce Research Natural Area, nor is research activity currently being conducted.

A portion of Eight Dollar Mountain is being considered as a National Natural Landmark by the National Park Service. Designation as a Natural Landmark would not affect BLM jurisdiction to manage the area, NPS is the Departmental lead agency in these investigations. The study is not yet complete, and no other data are available.

The Woodcock Bog area is expected to be recommended as a Research Natural area.

All three aforementioned areas are in the southwestern portion of the SYU. See Figure 2.1.4-6.

Residencies

Small Tract Leases

Five-acre tracts leased under the Small Tract Act of June 1, 1938 (Repealed by P.L. 94-579) are occupied at two sites in the Josephine SYU. These sites are shown on Figure 2.1.4-6 and listed in Table 2.1.4-8. These leases have expired and cannot be renewed under the voided Small Tract Act, but are being reappraised. Residency will probably continue, although the type of leasing agreement is yet to be determined.

Mining Claim Leases

Two five-acre tracts and one 2.5-acre tract have been leased on a life tenancy basis. The leases were granted on a rental basis under the provisions of the Mining Claim Occupancy Act of October 23, 1962. These sites are shown on Figure 2.1.4-6 and listed in Table 2.1.4-8.

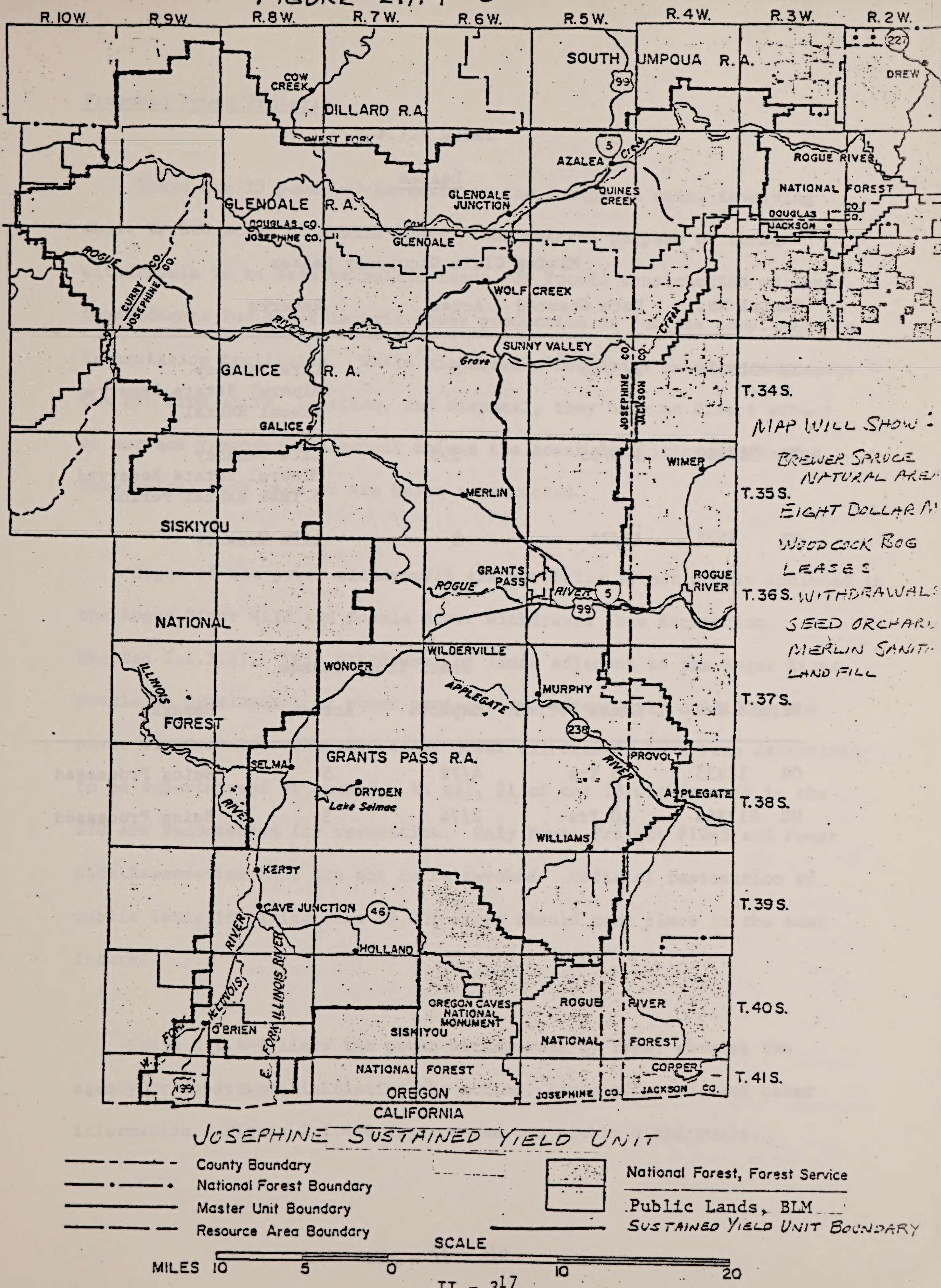

R.10W.
R.9W.
R.8W.
R.7W.
R.6W.
R.5W.
R.4W.
R.3W.
R.2W.
SOUTH UMPQUA R.A.
COW CREEK
DILLARD R.A.
DREW
AZALEA
GLENDALE JUNCTION
QUINES CREEK
ROGUE RIVER NATIONAL FOREST
DOUGLAS CO.
JACKSON CO.
GLENDALE R.A.
DOUGLAS CO.
JOSEPHINE CO.
GLENDALE
ROGUE
CURRY CO.
JOSEPHINE CO.
WOLF CREEK
RIVER
SUNNY VALLEY
Grave
GALICE R.A.
JOSEPHINE CO.
JACKSON CO.
GALICE
T.34S.
WIMER
MERLIN
T.35S.
SISKIYOU
GRANTS PASS
ROGUE
RIVER
ROGUE RIVER
T.36S.
NATIONAL
WILDERVILLE
WONDER
ILLINOIS
APPLEGATE
MURPHY
T.37S.
FOREST
GRANTS PASS R.A.
SELMA
DRYDEN
Lake Selmac
RIVER
PROVOLT
APPLEGATE
T.38S.
WILLIAMS
KERBY
CAVE JUNCTION
HOLLAND
RIVER
ILLINOIS RIVER
T.39S.
OREGON CAVES NATIONAL MONUMENT
SISKIYOU
ROGUE RIVER
NATIONAL FOREST
T.40S.
O'BRIEN
W. FORK ILLINOIS
E. FORK
NATIONAL FOREST
COPPER
T.41S.
OREGON
CALIFORNIA
JOSEPHINE CO.
JACKSON CO.
JOSEPHINE SUSTAINED YIELD UNIT
MAP WILL SHOW:
BREWER SPRUCE NATURAL AREA
EIGHT DOLLAR M
WOODCOCK BOG
LEASES
WITHDRAWALS
SEED ORCHARD
MERLIN SANIT. LANDFILL
County Boundary
National Forest Boundary
Master Unit Boundary
Resource Area Boundary
National Forest, Forest Service
Public Lands, BLM
SUSTAINED YIELD UNIT BOUNDARY
SCALE
MILES 10 5 0 10 20

TABLE 2.1.4-8

Leases

Mining Claim Occupancy Leases

Serial No.	Date Granted	Acres	Remarks
OR 016378	2/3/66	5	Life Tenancy Mineral Estate Reserved Annual Rental
OR 013480	1/8/65	2.5	Life Tenancy Mineral Estate Reserved 5 Year Rental Period
OR 8227	11/74	5	Life Tenancy

Small Tract Leases

Permit No.	Lease Period	Expires	Acres	Remarks
OR 12835	5 Yrs	4/72	5	Being Processed
OR 012868	10 Yrs	2/74	5	Being Processed

Proposed Power Projects

There are 23 power withdrawals in the Josephine unit, involving about 29,018 acres of public lands. The general purpose of these withdrawals is to reserve public lands for future construction of water impoundments for hydroelectric power production or for the complementing transmission facilities. While withdrawals for these purposes segregate the NRL from entry, location, and disposal, they have no direct effect on surface resource management unless the power facilities (including reservoirs) have been or are being constructed.

Eight of the power withdrawals are partially if not wholly included in the Rogue River Wild and Scenic River Withdrawal (see Recreation, Section 2.1.3.1). This withdrawal of lands adjacent to the Rogue River precludes development of power projects and effectively nullifies the power withdrawals. Thirteen other power withdrawals have been determined to be superimposed or unused. In all, 21 of the 23 withdrawals in the SYU are recommended for revocation. Only Power Project #1045 and Power Site Reservation #658 are not to be revoked. Official restoration of public lands involving some 29,000 acres should take place in the near future.

Table 2.1.4-9 lists the power withdrawals by type, showing the agency or department initiating the action, acres affected, and other information. Figure 2.1.4-6 depicts the two viable withdrawals.

TABLE 2.1.4-9 .

Power Withdrawals

Withdrawal Type & Number	Initiating Agency 1/	Acres (Approximate)	Purpose	Remarks
Power Project # 853	FPC	3311	Unspecified	Along Illinois River
Power Project #1045	FPC	3.	Trans. Line	50' Each Side Center Line
Power Project # 903	FPC	6750	Unspecified	Along Rogue River
Power Project #1059	FPC	22	Trans. Line	50' Each Side Center Line
Power Project #1116	FPC	6	Trans. Line	" " " " "
Power Project # 437	FPC	322	Unspecified	Power For Mt. Reuben Mining Co.
Power Site Classification # 123	ID	640	Unspecified	Along Rogue River
Power Site Classification # 158	ID	72	Reservoir	Not Built (Applegate River)
Power Site Classification # 330 3/	ID	200	Unspecified	Grave & Jumpoff Joe Creeks
Power Site Classification # 143	ID	9640	" "	Along Rogue River
Power Site Classification # 167	ID	314	" "	Along Rogue River
~~Power Site Classification # 196~~	~~ID~~	~~6~~	~~" "~~	~~" " "~~
Power Site Reservation # 617	ID	140	" "	" Illinois "
Power Site Reservation # 618	ID	1600	" "	" " "
Power Site Reservation # 621	ID	1120	" "	" Rogue "
Power Site Reservation # 653	ID	66	Trans. Line	50' Each Side Center Line
Power Site Reservation # 658	ID	16	" "	" " " " "
Power Site Reservation # 623	ID	760	Unspecified	Along Rogue River
Power Site Reservation # 649 2/	ID	236	Trans. Line	50' Each Side Center Line
Water Power Designation # 10	ID	1640	Unspecified	Along Rogue River
Water Power Designation # 13 2/	ID	254	Trans. Line	50' Each Side Center Line
Water Power Designation # 18 3/	ID	300	Unspecified	Grave and Jumpoff Joe Creeks
Water Power Designation # 14	ID	1600	" "	Along Rogue River
TOTAL		29018		

1/ FPC = Federal Power Commission
ID = Interior Department

2/ These Two Withdrawals Overlap

3/ These Two Withdrawals Overlap

Unauthorized Uses

Occupancies

There are 72 registered cases of unauthorized occupancy in the SYU.

Thirty-one of these cases involve occupancy of unpatented mining claims known or suspected to be invalid. Filing of new mining claims of doubtful validity, with subsequent construction of dwellings, and the reactivation of previously inactive claims, with subsequent expansion and/or renovation of dwellings, frequently occurs. The Federal Land Policy and Management Act of 1976 requires that the owner of an unpatented mining claim must record that claim within three years from the date of the Act (21 Oct. 1976), and every year thereafter. Claims located after the date of the Act must be recorded prior to 31 December of each year following the calendar year in which the claim was located.

Numerous unregistered, unauthorized occupancies exist on public lands, both on and off mining claims. No estimate of acres involved is available. BLM registers and investigates cases as available manpower and funds permit. Determinations, final decisions and actions in these cases take more time than is usually available; thus a backlog of cases exists.

Water Facilities

Unauthorized use of public lands for domestic water includes wells, spring developments, ditches, and pipelines. Installation of these facilities is occurring more often with the increasing number of residences on or immediately adjacent to public lands. No data are available on the number of facilities constructed.

Dumping

Indiscriminate dumping occurs in isolated areas throughout the SYU, most frequently on or adjacent to occupied mining claims. When and if identified, persons suspected of dumping are requested to remove the debris from public lands. Local enforcement officials, e.g., county sheriffs, normally cooperate with BLM in dealing with violators.

Sanitary Landfills

The city of Grants Pass has a Recreation and Public Purposes lease on the Merlin Sanitary Landfill near the town of Merlin. The lease was granted in May 1967 for 25 years and involves about 120 acres of NRL, shown on Figure 2.1.4-6. A small sanitary landfill, on private land, serves the Cave Junction area.

Experimental Site

The Charles A. Sprague Seed Orchard encompasses about 200 acres (Figure 2.1.4-6) of public lands withdrawn under Public Land Order 4132 by the Secretary of the Interior. It is operated by Medford District BLM personnel in a program for tree improvement through genetics. Principle efforts are toward blister rust resistant sugar pine with cross breeding and development of superior Douglas fir strains through vegetative propagation. The facility includes structures, a parking lot, dam and reservoir, irrigation system, and wells.

FUTURE ENVIRONMENT WITHOUT THE PROPOSED ACTION

The future environment without the proposed action is considered to be the environment that would result from continuation of the existing timber management plan for the SYU. Continuation of that plan, and the environment that would result, are addressed in the discussion of the "no-action" alternative in Chapter 8.

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Appendix II

Common and Scientific Name of Plants Referenced in the Text

TERRESTRIAL PLANTS

Alaska Onion-Grass	Melica subulata (Griseb.) Scribn.
Baldhip Rose	Rosa gymnocarpa Nutt.
Bear Bush	Garrya fremonti Torr.
Bedstraw	Galium
Big Squirreltail	Sitanion jubatum J.G. Smith
Bigleaf Maple	Acer macrophyllum Pursh
Birchleaf Mountain Mahogany	Cercocarpus H.B.K. betuloides Nutt
Blue elderberry	Sambucus cerulea
Blue Wildrye	Elymus glaucus Buckl.
Blue Blossom	Ceanothus thyrsiflorus Esch.
Bluebunch wheatgrass	Agropyron spicatum (Pursh) Scribn. & Smith
Box-Leaved Garrya (silk-tassel)	Garrya buxifolia Gray.
Brodiaea	Brodiaea
California Blackoak	Quercus kelloggii Newb.
California Coffee Berry	Rhamnus californica Esch. var. occidentalis (How.) Jeps
California Fescue	Festuca californica vasey
California Hazel	Corylus cornuta Marsh. var. californica (DC.) Sharp.
California Honeysuckle	Lonicera hispidula (Lindl.) Dougl. ex T.& G. var. vacillans (Benth.) Gray
California oatgrass	Danthonia californica
Canada Bluegrass	Poa compressa
Canyon Live Oak	Quercus chrysolepis Liebm.
Collomia	Collomia spp.
Common Beargrass	Xerophyllum tenax (Pursh) Nutt.
Common woolly sunflower	Eriophyllum lanatum (Pursh) Forbes
Coyote Mint	Monardella villosa Benth.
Creambush Oceanspray	Holodiscus discolor (Pursh) maxim.
Creeping Snowber :	Symphoricarpos mollis Nutt. var hesperius (G.N. Jones) Cronq.

Curlleaf Mountain Mahogany	Cercocarpus ledifolius Nutt. in T.& G.
Currant	Ribes spp.
Deerbrush	Ceanothus integerrimus H&A
Deerfoot Vanilla Leaf	Achlys triphylla (Smith) D.C.
Douglas-fir	Pseudotsuga taxifolia
Dusty Pink	
Dwarf Ceanothus	Ceanothus pumilus Greene
Geyer Oniongrass	Melica bulbosa Geyer ex Porter & Coult
Golden Chinquapin	Castanopsis chrysophylla
Gooseberry	Ribes spp.
Grand fir	Abies grandis (Dougl.) Lindl
Green Manzanita	Arctostaphylos patula Greene
Hoary manzanita	Archtostaphylos canescens Eastw.
Huckleberry Oak	Quercus vaccinifolia Kellogg
Idaho Fescue	Festuca idahoensis Elm.
Incense-cedar	Calocedrus decurrens
Jeffrey Pine	Pinus jeffreyi Grev. & Balf.
Junegrass	Koeleria cristata (L.) Pers.
Klamath Plum	
Klamath Weed	Hypericum perforatum
Knobcone Pine	Pinus attenuata Lemm.
Lemon Needlegrass	Stipa lemmonii (Vasey) Scribn.
Lomatium	Lomatium spp.
Mountain Brome	Bromus marginatus nees
Mountain white-thorn	Ceanothus cordulatus Kell.
Oregon Ash	Fraxinus latifolia Benth.
Oregon Grape	Berberis nervosa Pursh
Oregon Myrtle	
Oregon White Oak	Quercus garryana Dougl.
Pacific Dogwood	Cornus nuttallii And. ex T.& G.
Pacific Madrone	Arbutus menziesii Pursh
Pacific Poison Oak	Rhus diversiloba T.& G.
Pale Serviceberry	Amelanchier pallida Greene
Pine Bluegrass	Poa scabrella (Thurb.) Benth. ex. Vasey
Pine-Mai Manzanita	Archtostaphylos nevadensis Gray
Podfern	Chelianthes siliquosa Maxon

Ponderosa Pine	Pinus ponderosa
Port-Orford-Cedar	Chamaccyparis lawsoniana (A. Murr.) Parl.
Pygmy Oregon Grape	Berberis pumila Greene
Red Huckleberry	Vaccinium parrivolium Smith
Pacific Rhododendron	Rhododendron macrophyllum G. Don
Rocky Mountain Maple	Acer glabrum Torr.
Sadler Oak	Quercus sadleriana R. Br.
Salal	Gaultheria shallon Pursh
Saskatoon Serviceberry	Amelancier alnifolia Nutt.
Sedges	Carex spp.
Shasta Red Fir	Abies magnifica murr. var. shastensis lemm.
Sheep Fescue	Festuca ovina L.
Skunkbrush sumac	Rhus trilabata Nutt. in T.& G.
Small Golden Chinquapin	Castanopsis chrysophylla var. minor Benth
Small-Flowered Willow Weed	Epilobium minutum Lindl. ex Hook.
Snowbrush ceanothus	Ceanothus velutinus Dougl. ex Hook.
Snow Dewberry	Rubus nivalis Dougl. ex Hook.
Sugar Pine	Pinus lambertiana Dougl.
Sword Fern	Polystichum munitum (Kaulf.) Presl
Tanoak	Lithocarpus densiflorus (Hook. & Arn.) Rehd.
Tansy ragwort	Senecio jacobea
Trailing Blackberry	Rubus ursinus Cham. & Schlecht.
Twinflower	Linnaea borealis l.
Vine Maple	Acer circinatum Pursh.
Wedgeleaf ceanothus	
Western Fescue	Festuca occidentalis Hook.
Western Hemlock	Tsuga heterophylla (Raf.) Sarg.
Western Redcedar	Thuja plicata Donn
Western White Pine	Pinus monticola Dougl. ex. D. Don
Western Yew	Taxus brevifolia Nutt.
Whipple vine	Whipplea modesta Torr.
White Alder	Alnus rhombifolia Nutt.
White cedar (Port Orford Cedar)	Chamaecyparis lawsoniana
White Fir	Abies concolor (Gord. & Glend.) Lindl.
White-leaved Manzanita	Arctostaphylos viscida Parry
White stem Gray Rabbitbrush	Chrysothamnus nauscosus var. albicaulis Hall. & Clem.
Wooly Eriopnyllcum (common woolly sunflower)	Eriophyllum lanatum (Pursh) Forbes
Yarrow	Achillea millefolium L.

AQUATIC PLANTS

Arrowheads	Sagittaria
Algae	Chara Spp.
Algae	Nitella Spp.
Algae	Tolypella spp.
Aquatic Mosses	Fontinales spp.
Attached Green Algae	Cladophores
Blue-green algaes	Euglena spp., Oscillatoria spp., Rivoloria spp.
Bulrushes	Scirpus Spp.
Bur Reeds	Sparganium Spp.
Cattails	Typha spp.
Coontail	Aratophyllum
Darlingtonia or Pitcher Plant	Darlingtonia spp.
Diatoms	Bacillariaceae
Green Algaes	Chlorophyta
Muskgrass	
Naiads	Najas
Pickerelweeds	Pontederia spp.
"Pond Scums"	Spirogyra, Zygnema, & Oedogonium.
Pond Weeds	Family Potamogetonaceae
Spike Rushes	Eleocharis spp.
Water Lilies	Nymphaea spp.
Water milfoils	Myriophyllum
water shield	Braremia spp.
Waterweed	Flodea or Anacharis
Wild Celery	Vallismarm

DISEASE CAUSING PLANTS

Brown Trunk Rot	Fomitopsis (Fomes) officianalis
Douglas-fir Dwarf Mistletoe	Arceuthobium douglasii
Laminated Root Rot	Phellinus (Poria) weirii
Pocket Dry Rot	Polyporus amarus
Port-Orford-Cedar Root Rot	Phytophthora lateralis
Red-Brown Butt Rot	Phaeolus (Polyporus) schweinitzii
Shelf Fungus	Fomes applanatus
Shoestring Root Rot	Armillariaella mellea
Spongy Sap Rot	Fomitopsis (Fomes) annosa
White Pine Blister Rust	Cronartium ribicola
White Pocket Rot	Phellinus (Fomes) pini

Appendix III. Common and Scientific Names of Animals Referenced in Text.

MAMMALS

Common Name	Scientific Name
Badger	Taxidea taxus
Beaver	Castor canadensis
Big brown bat	Eptesicus fuscus
Black bear	Ursus americanus
Black-tailed deer	Odocoileus hemionus columbianus
Black-tailed jack rabbit	Lepus californicus
Bobcat	Lynx rufus
Botta pocket gopher	Thomomys bottae
Brush rabbit	Sylvilagus bachmani
California bat	Myotis californicus
California vole	Microtus californicus
Cougar	Felis concolor
Coyote	Canis latrans
Deer mouse	Peromyscus maniculatus
Gray fox	Urocyon cinereoargenteus
Long-eared myotis	Myotis evotis
Marten	Martes americana
Mink	Mustela vison
Mountain beaver	Aplodontia rufa
Muskrat	Ondatra zibethicus
Northern flying squirrel	Glaucomys sabrinus
Pacific shrew	Sorex pacificus
Porcupine	Erethizon dorsatus
Raccoon	Procyon lotor
Red fox	Vulpes fulva
Ringtail	Bassariscus astutus
River otter	Lutra canadensis
Rossevelt elk	Cervus canadensis rooseveltii
Silver gray squirrel	Sciurus griseus
Snowshoe hare	Lepus americanus
Spotted skunk	Spilogale putorius
Townsend's chipmunk	Eutamius townsendii
Townsend mole	Scapanus townsendii
Townsend's Vole	Microtus townsendii
Water shrew	Sorex palustris
Western harvest mouse	Reithrodontomys megalotis
Yellow-bellied marmot	Marmota flaviventris

BIRDS

Common Name	Scientific Name
American coot	Fulica americana
Anna's hummingbird	Calypte anna
Bald eagle	Haliaeetus leucocephalus
Band-tailed pigeon	Columba fasciata
Belted kingfisher	Megaceryle alcyon
Black phoebe	Sayornis nigricans
Black-backed three-toed woodpecker	Picoides arcticus
Blue grouse	Dendragapus obscurus
Brewer's blackbird	Euphagus cyanocephalus
California gull	Larus californicus
California quail	Lophortyx californicus
Canada goose	Branta canadensis
Cedar waxwing	Bombycilla cedrorum
Clark's nutcracker	Nucifraga columbiana
Cliff swallow	Petrochelidon pyrrhonata
Common crow	Corvus brachyrhynchos
Common flicker	Colaptes cafer
Common merganser	Mergus merganser
Common raven	Corvus coras
Dark-eyed junco	Junco oreganus
Dipper	Cinclus mexicanus
Fox sparrow	Passerella iliaca
Golden eagle	Aquila chrysaetos
Great horned owl	Bubo virginianus
Greater yellow legs	Tringa melanoleucus
Green-tailed towhee	Pipilo chlorurus
Hermit warbler	Derdroica occidentalis
House finch	Carpodacus mexicanus
House sparrow	Passer domesticus
House wren	Troglodytes aedon
Killdeer	Charadrius vociferus
Lark sparrow	Chondestes grammicus
Lazuli bunting	Passerina amoena
Lesser goldfinch	Carduelis psaltria
Mallard	Anas platyrhynchos
Mountain chickadee	Parus gambeli
Mountain quail	Oreortyx pictus
Mourning dove	Zenaida macroura
Nashville warbler	Vermivora ruficapilla
Olive-sided flycatcher	Nuttallornis borealis
Osprey	Pandion haliaetus
Peregrine falcon	Falco peregrinus
Pileated woodpecker	Dryocopus pileatus
Pintail	Anas acuta
Plain titmouse	Parus inornatus
Prairie falcon	Falco mexicanus
Purple finch	Carpodacus purpureus
Red-tailed hawk	Buteo jamaicensis
Red-winged blackbird	Agelaius phoeniceus
Ring-necked pheasant	Phasianus colchicus
Ruby-crowned Kinglet	Regulus calendula

Common Name	Scientific Name
Ruffed grouse	Bonasa umbellus
Rufous-sided towhee	Pipilo erythropthalmus
Savanna sparrow	Passerculus sandwitchensis
Screech owl	Otus asio
Scrub jay	Aphelocoma coerulescens
Solitary vireo	Vireo solitarius
Song sparrow	Melospiza melodia
Sora	Porzana carolina
Spotted owl	Strix occidentalis
Starling	Sturnus vulgaris
Swainson's thrush	Hylocichla ustulata
Townsend's warbler	Dendroica townsendi
Violet-green swallow	Tachycineta thalassina
Virginia rail	Rallus limicola
Western bluebird	Sialia mexicana
Western kingbird	Tyrannis verticalis
Western meadowlark	Sturnella neglecta
Western tanager	Piranga ludoviciana
White-breasted nuthatch	Sitta carolinensis
White-crowned sparrow	Zonotrichia leucophrys
White-headed woodpecker	Picoides albolarvatus
Willow flycatcher	Empidonax traillii
Winter wren	Troglodytes troglodytes
Wood duck	Aix sponsa
Yellow-rumped warbler	Dendroica auduboni

REPTILES AND AMPHIBIANS

California kingsnake	Lampropeltis getulus californiae
California mountain kingsnake	Lampropeltis zonata
Mountain gatersnake	Thamnophis elegans elegans
Northern alligator lizard	Gerrhonotus coeruleus
Northern fence lizard	Sceloporus occidentalis occidentalis
Northwestern gartersnake	Thamnophis ordinoirdes
Oregon alligator lizard	Gerrhonotus multicarinatus scincicauda
Oregon garter snake	Thamnophis counchi hydrophila
Pacific gopher snake	Pituophis melanoleucus catenifer
Pacific ringneck snake	Diadophis punctatus amabilis

Common Name	Scientific Name
Pacific rubber boa	Charina bottae bottae
Red-spotted garter snake	Thamnophis sirtalis
Sagebrush lizard	Sceloporus graciosus
Sharp-tailed snake	Centia tenuis
Striped whipsnake	Masticophis taeniatus
Western pond turtle	Clemmys marmorata
Western rattlesnake	Crotalus viridis oreganus
Western skink	Eumeces skiltonianus
Western yellow-bellied racer	Coluber constrictor mormon

INVERTEBRATES

Ants	Family FORMICIDAE
Barklice	Order PSOCOPTERA
Beetles	Order COLEOPTERA
Blackflies	Family SIMULIIDAE
Centipedes	Class CHILOPODA
Cicadas	Order HOMOPTERA
Cinnabar moth	Tyria jacobaea
Dobsonflies	Order MEGALOPTERA
Douglas-fir beetle	Dendroctonus pseudotsugae
Dragonflies	Order ODONATA
Earthworms, potworms	Order OLIGOCHAETA
Earwigs	Order DERMAPTERA
Fir engraver	Scolytus ventralis
Flea beetle	Longitarsus jacobaeae
Flatheaded fir borer	Melanophila drummondi
Flies and midges	Order DIPTERA
Grasshoppers, crickets, roaches	Order ORTHOPTERA
Harvestmen	Order PHALANGIDA
Long-horned flies	Suborder NEMATOCERA
Millipedes	Class DIPLOPODA
Moths, butterflies	Order LEPIDOPTERA
Mountain pine beetle-	Dendroctonus ponderosae
Nematodes	Class NEMATODA
Net-spinning caddisflies-	Family HYDROPSYCHIDAE
Primitive caddisflies-	Family RHYACOPHILIDAE
Ichneumon wasps	Family ICHNEUMONIDAE
Seedfly	Hylemya Seneciella
Small mayflies-	Family BAETIDAE
Snails and slugs	Order PULMONATA
Sowbugs	Order ISOPODA
Spiders	Order ARANEAE
Springtails	Order COLLEMBOLA
Stoneflies -	Order PLECOPTERA
Termites	Order ISOPTERA
Ticks and mites	Order ACARINA
True bugs	Order HEMIPTERA
Western pine beetle-	Dendroctonus brevicomis

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